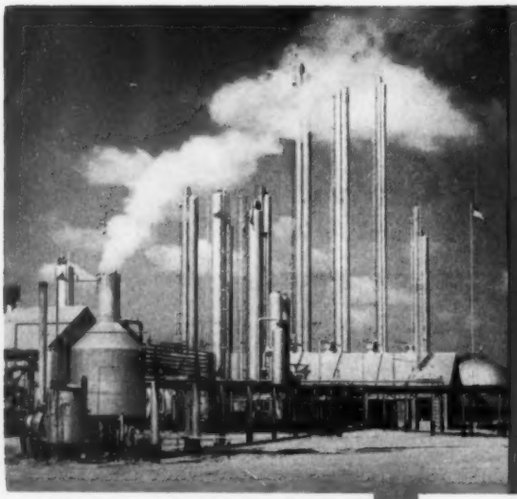
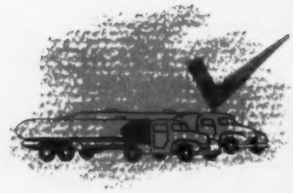
THIRTIETH ANNUAL MEETING

World Petroleum

NOVEMBER, 1950 five dollars per year fifty cents per copy



Any Way You Want it!



WARREN'S *Stabilized* NATURAL GASOLINE and STA-VOL-ENE

Warren is not only the world's largest marketer of Natural Gasoline and LPG products, but a large manufacturer and exporter of these products as well. Warren's far-flung network of facilities works hand-in-glove to serve its customers at home and abroad. Every method of commercial communication and every agency of freight distribution are synchronized with Warren's sales, executive, production and traffic departments.

That's why the world's refiners rely upon Warren for Unfailing Quality, Unusual Service and Uniform Delivery of Stabilized Natural Gasoline.

WARREN PETROLEUM CORPORATION

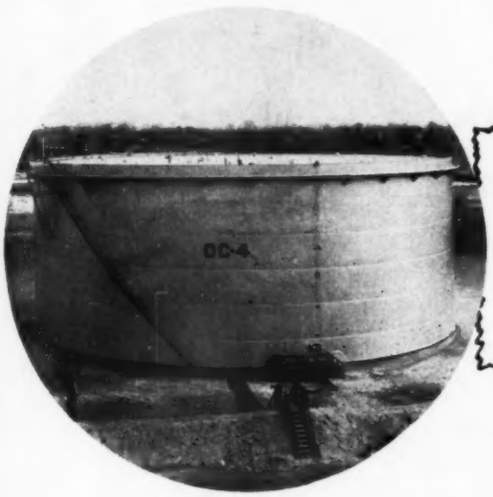
Producers, Manufacturers, Exporters and Marketers

Export Terminals: Corpus Christi, Port Arthur, Baytown, Texas City, and Norsworthy, Houston, Texas.

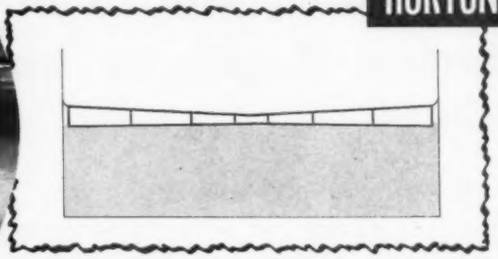
TULSA 2, OKLAHOMA CABLE ADDRESSES: Stavolene, Warren

Crude Oil, Natural Gasoline and Liquefied Petroleum Products

Which of these THREE Horton Roofs is *right* for *your* storage tanks?



HORTON DOUBLE-DECK FLOATING ROOF



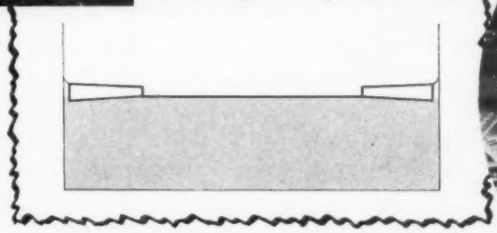
This type—most recent design of all three—incorporates the best construction features gained in many years of experience building floating roofs. The air space between the decks provides insulation over the entire area, making it possible to handle crude oil, motor gasoline, and some of the less volatile natural gasolines with practically no evaporation loss. All evaporation losses caused by filling and emptying are eliminated. Fire hazard is reduced and corrosion of the tank and roof is cut to a minimum. Installed on new or existing tanks 15 ft. in diam. or larger.

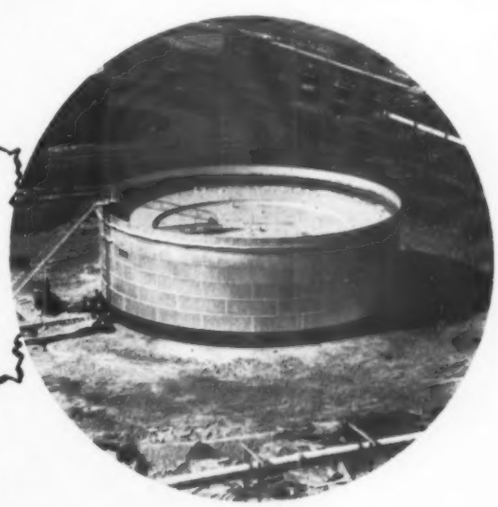
Above: Sketch showing how double-deck construction provides insulating space over entire area of tank.

Left: Aerial view of a Horton Double-Deck Roof floating near the bottom of a crude storage tank at the Estero, Calif., station of the Valley Pipe Line Co.

HORTON PONTOON FLOATING ROOF

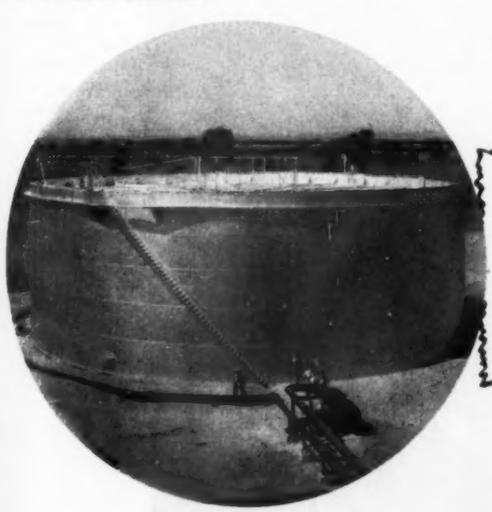
In this type, the annular pontoon around the outer edge of the roof provides air space insulation for a large part of the area. Boiling losses are prevented from all but the most volatile gasolines and crude oils. If some boiling should occur, the vapor is trapped under the center section of the deck, which domes upward, forming a blanket of vapor that reduces further boiling. This efficient roof reduces breathing losses, prevents filling and emptying losses, and cuts down corrosion of the tank and roof.



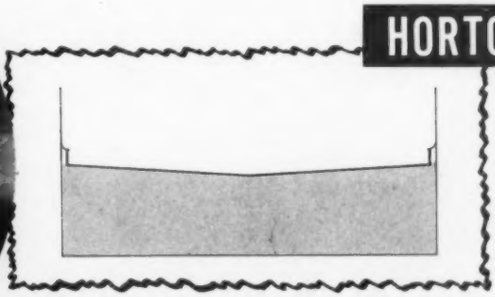


Above: Sketch showing how annular pontoon provides insulating air space for a large part of the area of this tank.

Right: View of a tank equipped with a Horton Pontoon Roof at the Esso Standard Oil Company refinery at Baton Rouge, La.



HORTON PAN FLOATING ROOF



This type of floating roof has the longest service in the petroleum industry. It is used extensively for reducing corrosion in tanks handling sulphur crudes or other corrosive products. It is recommended for use on tanks handling fuel oil and other petroleum products where "boiling" losses are not an important factor. The Horton Pan Floating Roof prevents filling and emptying losses, reduces breathing losses, and cuts down the fire hazard in the tank. It can be installed on new or flat-bottom tanks that are 15 ft. in diam. or larger.

Above: Sketch showing how the PAN roof has a deck of single thickness over the entire area.

Left: Aerial view of a sour crude storage tank equipped with a Horton PAN Floating Roof at a large Gulf Coast refinery.

*Horton is a trade name for products built by the Chicago Bridge & Iron Company. You can get complete information on the three types of Horton Floating Roofs by writing the nearest office listed below.

CHICAGO BRIDGE & IRON COMPANY

Chicago • Houston • Tulsa • San Francisco • Birmingham • Atlanta • Cleveland • Philadelphia • Los Angeles • Salt Lake City • Boston • Seattle • Detroit

Plants: Birmingham, Chicago, Salt Lake City and Greenville, Pa., U.S.A. Export Office—165 Broadway Building, New York 6, N. Y., U.S.A.

REPRESENTATIVES AND LICENSEES

Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Comprime N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Horton Steel Works, Limited, Fort Erie, Ontario, Canada
W. P. Bryant, Edificio Ahrus 402, Havana, Cuba
Sociedade Chibridge de Construcoes Ltda., Rio de Janeiro, Brazil

Every Refinery and Tank Installation Engineer knows . . .

that he is surrounded every day by the most serious of all fire risks. He knows, too, that every fire no matter how small must be stopped immediately if he is to avoid a major fire where all his experience combined with the use of major foam fire fighting equipment will be needed to subdue it. The Pyrene Company is the largest manufacturer in the world of Mechanical Foam Fire Fighting Equipment and Foam Compound and more major oil fires have been extinguished with this equipment than with any other. The Company's engineers are at your disposal in any part of the world for consultation on this vitally important matter. Write now for their expert advice and recommendations concerning oil and spirit fires, affecting refineries, storage tank depots, service stations or other fire problems.

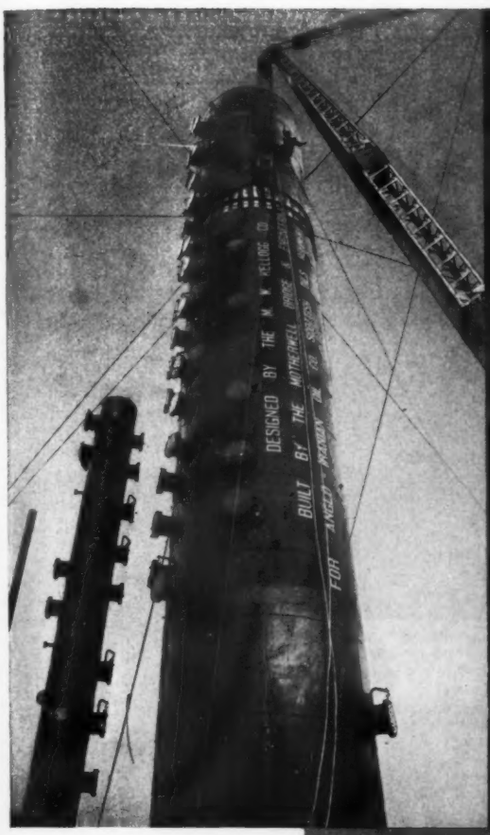
THE BEST KNOWN NAME IN FIRE PROTECTION

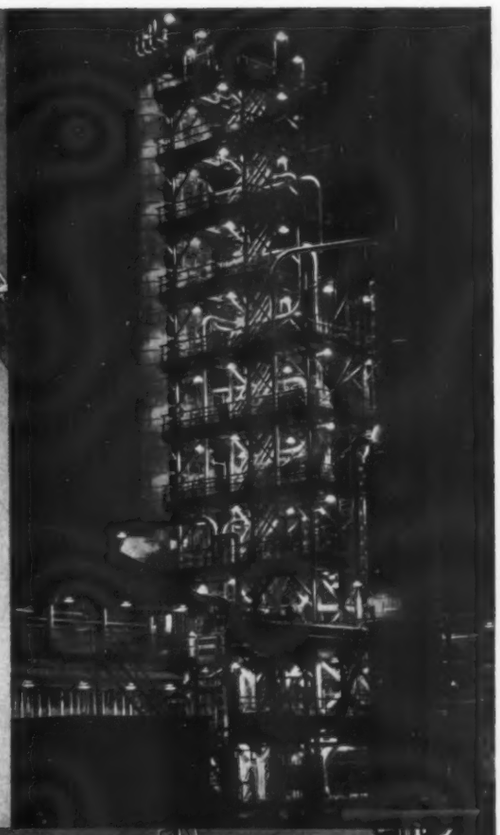
Pyrene TRADE MARK FIRE APPLIANCES

THE PYRENE COMPANY LIMITED, (Dept. W.P.) 9, GROSVENOR GARDENS, LONDON, S.W.I. ENGLAND

Associated with the Pyrene Manufacturing Company of America.

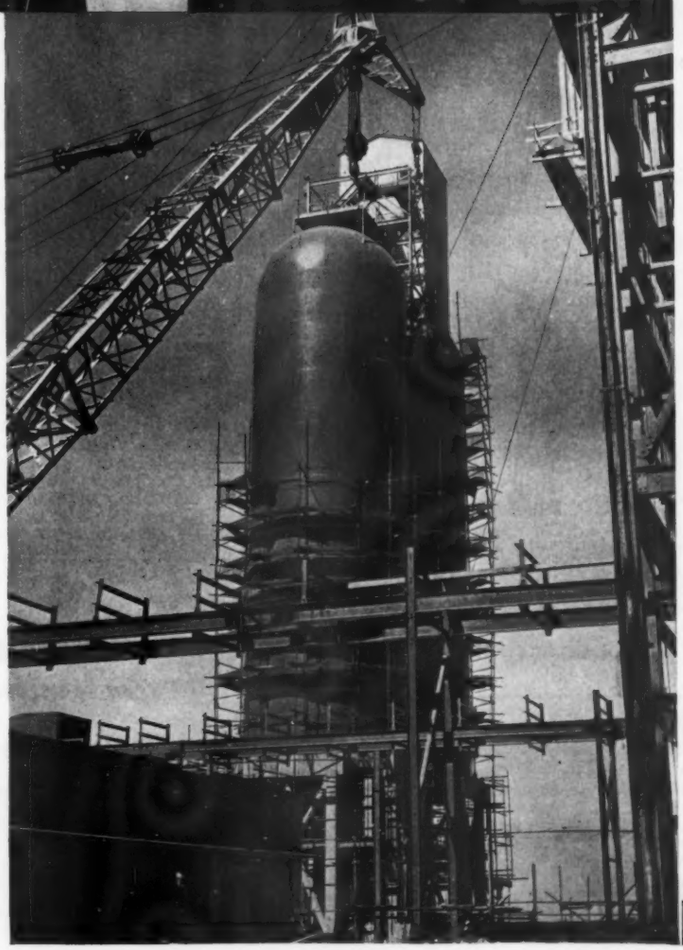
Going up!





Throughput of Anglo-Iranian's refineries in Great Britain increased by 50% in 1949, and new plant will more than double their existing capacity. Here you see (top left) the positioning of the main fractionating column of the new distillation plant at Grangemouth refinery in Scotland.

The night scene (top right) is the new 2,000,000 tons per annum distillation unit at Llandarcy refinery in South Wales.



Abadan Refinery processed another record total in 1949—23,245,000 tons of Anglo-Iranian's crude oil production in Persia. New catalytic cracking plant, shown here under construction, will further increase the capacity and operational flexibility of this huge refinery, largest in the world.

101.2

First and Biggest

oil producers in the Middle East since 1912, Anglo-Iranian Oil Company and its associated Companies also operate twelve refineries in Europe, Middle East and Australia ; their sales organisation includes major marketing or supply interests in Europe, Asia, Africa and Australasia, with international ships' bunkering and aviation services.

BP

This shield is the symbol of the world-wide organisation of

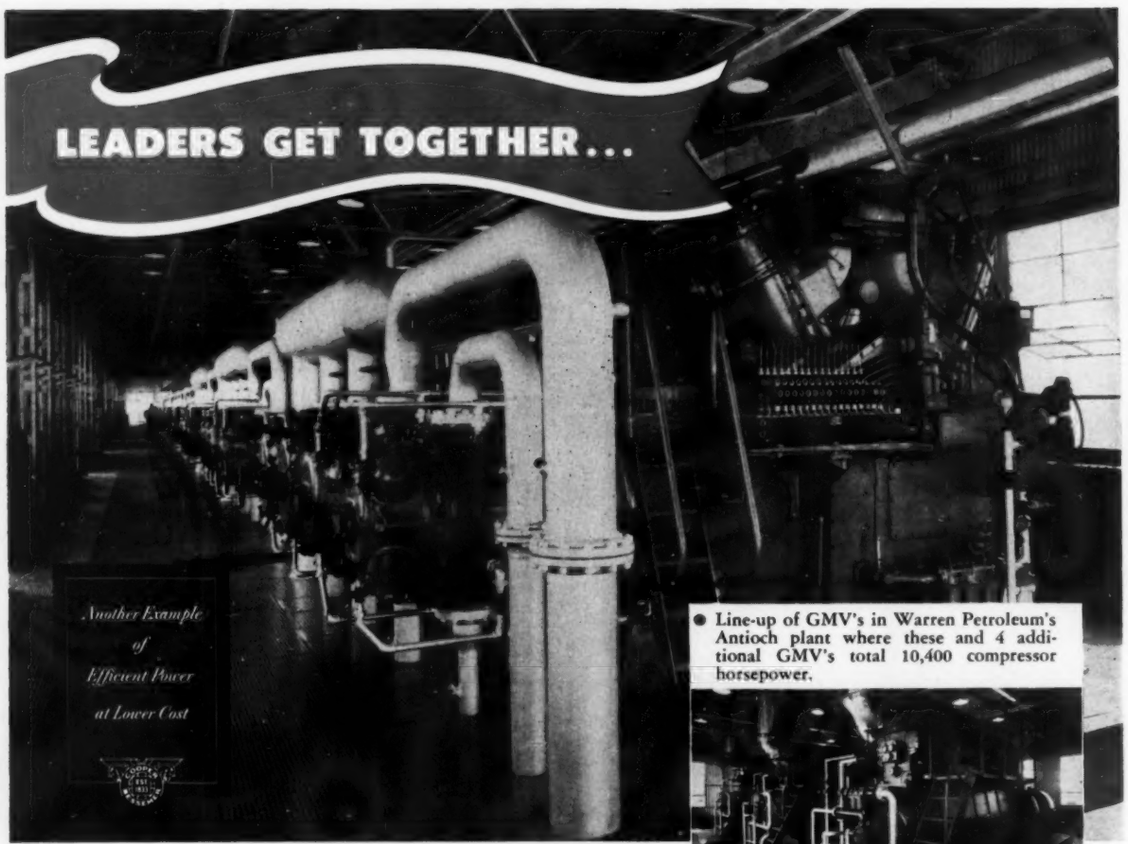
ANGLO-IRANIAN OIL COMPANY, LIMITED

Britannic House, Finsbury Circus, London, E.C.2.

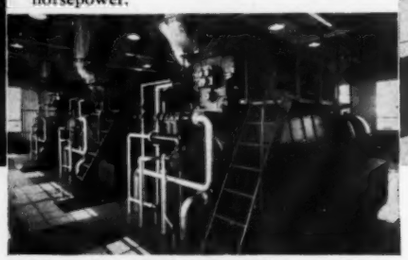
REPRESENTATIVE IN U.S.A.

W. D. HEATH EVES

610 Fifth Avenue, New York 20, N.Y.



● Line-up of GMV's in Warren Petroleum's Antioch plant where these and 4 additional GMV's total 10,400 compressor horsepower.



● These three 505 hp Cooper-Bessemer JS-6 gas engines drive lean oil pumps in Warren Petroleum's Maysville plant.

● At Warren Petroleum's Holliday plant, Cooper-Bessemer 4 cylinder twin-line pumps, driven by Cooper-Bessemer 150 hp GAW gas engines, are in gasoline work, each handling up to 14,500 bbl of lean oil a day at 800 psi.

for modern, highly efficient operation

Warren Petroleum Corporation, pioneer in gasoline extraction, has been long recognized as a leader in the natural gasoline industry. Recent plant expansions and processing advancements, aimed at greater propane recovery, contribute to the company's truly enormous field processing operation and help assure continued leadership.

The modern compressors, engines and pumps shown here are part of Warren Petroleum's most recently added facilities. They are now serving in various phases of the Company's gasoline work and pressure maintenance. All are Cooper-Bessemer units, built by a company likewise recognized as a leader in its field . . . *for over a century!*

When planning your power, compressing and pumping needs, be sure to check with Cooper-Bessemer on the new features, new developments that continue to uphold this kind of leadership.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York City Washington, D. C. Bradford, Pa. Parkersburg, W. Va. San Francisco, Calif. Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle, Wash. Tulsa, Okla. Shreveport, La. St. Louis, Mo. Los Angeles, Calif. Caracas, Venezuela Gloucester, Mass. Calmes Engineering Co., New Orleans, La.

You can't
say it
often enough!

"TWO GALLONS OF TODAY'S GASOLINE WILL DO THE WORK OF THREE GALLONS OF 1925 GASOLINE

—yet the price* per gallon is about the same!"

Here's a fact that every one of us in the oil industry can be proud of. By any measure of gasoline value—ton-mileage, performance, engine economy—today's top-quality gasolines give the motorist, the trucker and the farmer about 50% greater value than the gasoline he bought in 1925.

That's a record every American should be told about. To help refiners do this job, Ethyl gathered all the facts on the twenty-five-year increase in gasoline value, put them in a handy portfolio and distributed them to all refiners. In key cities, Ethyl is sponsoring a series of dramatic road tests for civic leaders and the press to further publicize the great gain in gasoline value.

**Excluding taxes.*

ETHYL CORPORATION, ***New York 17, N. Y.***

Other products sold under the "Ethyl" trade-mark: salt cake...ethylene dichloride...sodium (metallic)...chlorine (liquid)...oil soluble dye...benzene hexachloride (technical)

WORLD PETROLEUM for November, 1950. Vol. 21, No. 12, November, 1950. WORLD PETROLEUM is published monthly by Mona Palmer, Trustee under the will of Russell Palmer, 2 West 45th St., New York 19, N. Y. Acceptance at East Stroudsburg, Pa., under Section 34.64 P. L. & R. Authorized. Subscription rate: $5.00 per year, single copies 50c.

WORLD-WIDE PHOTOGEOLOGIC EVALUATION

geophoto services

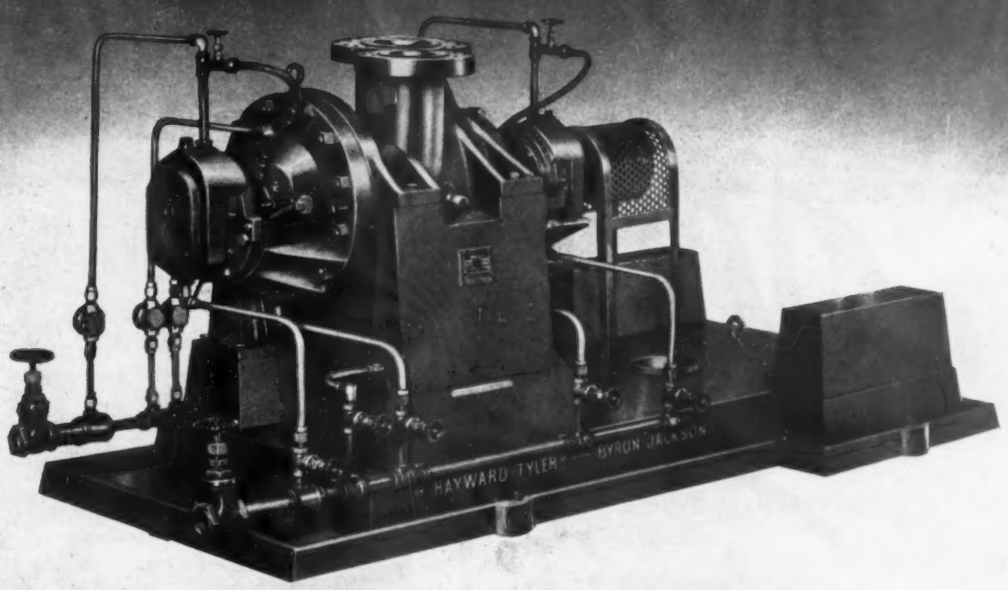
THE ERNEST & CRANMER BUILDING
DENVER 2, COLORADO
Cable Address: GEOPHOTO

V. ZAY SMITH • ROBERT McMILLAN
LAURENCE BRUNDALL • A. R. WASEM

BYRON JACKSON IN THE STERLING AREA

HAYWARD TYLER

BYRON JACKSON



THE high, world-wide reputation enjoyed by B. J. Pumps is maintained in the sterling area by Hayward Tyler and Co. Ltd. of Luton, England, British licensees for the manufacture of Byron Jackson Centrifugal Pumps.

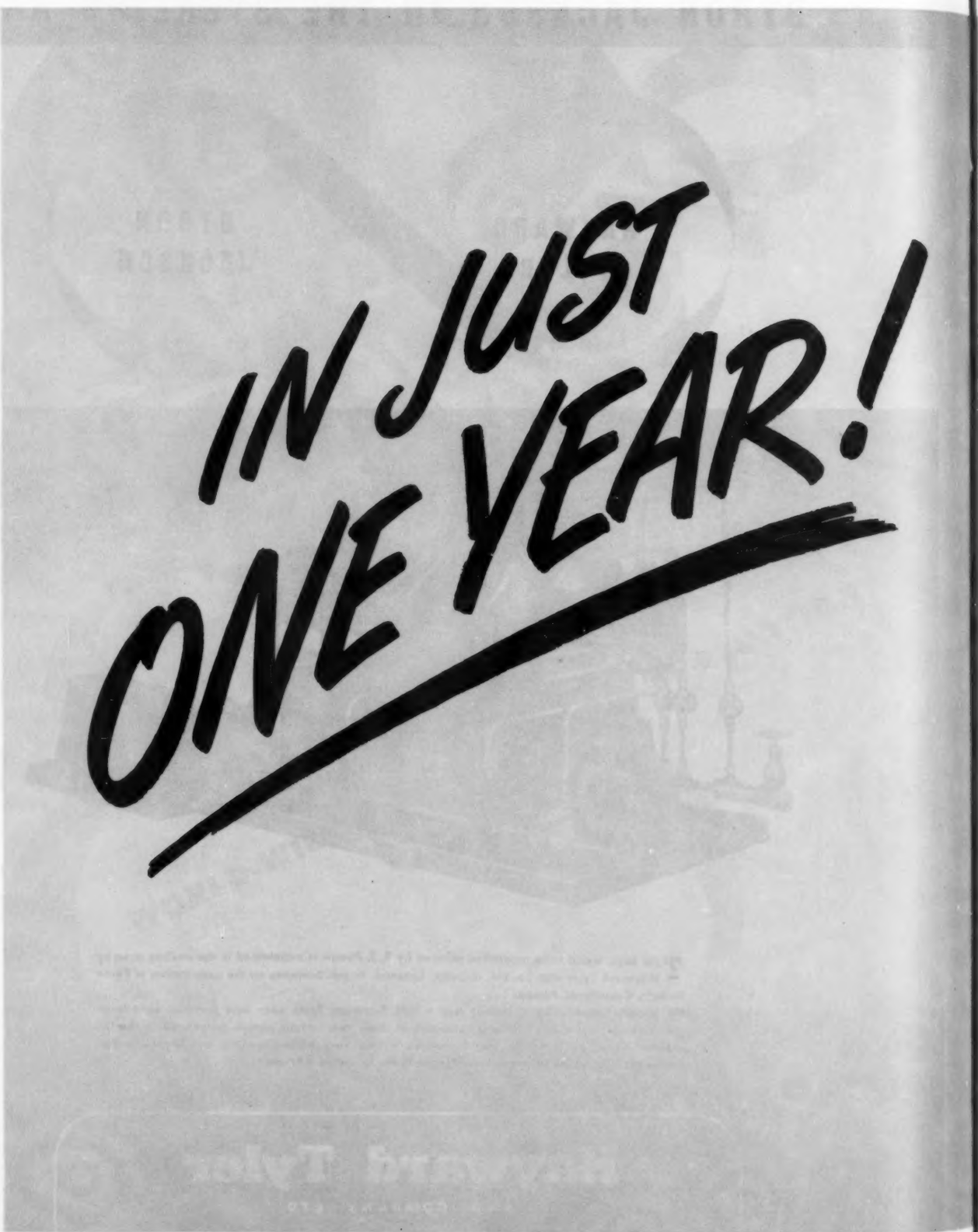
Pump manufacturers for a century and a half, Hayward Tyler have long practical experience and modern "know how." The combination of these two famous names guarantees to the Oil Industry in all parts of the world products of the very highest quality and craftsmanship. Please send enquiries for sterling purchases to the following address.

Hayward Tyler

AND COMPANY LTD

LUTON · BEDFORDSHIRE · ENGLAND

TELEPHONE: LUTON 3951


IN JUST
ONE YEAR!

THESE *EIGHT* REFINERS HAVE CHOSEN THE

PLATFORMING

PROCESS

OLD DUTCH REFINING COMPANY
Muskegon, Michigan

KENDALL REFINING COMPANY
Bradford, Pennsylvania

JOHNSON OIL REFINING COMPANY
Cleveland, Oklahoma

BELL OIL AND GAS COMPANY
Grandfield, Oklahoma

MID-WEST REFINERIES, INC.
Alma, Michigan

AURORA GASOLINE COMPANY
Detroit, Michigan

PREMIER PETROLEUM COMPANY
Fort Worth, Texas

ONYX REFINING COMPANY
Abilene, Texas

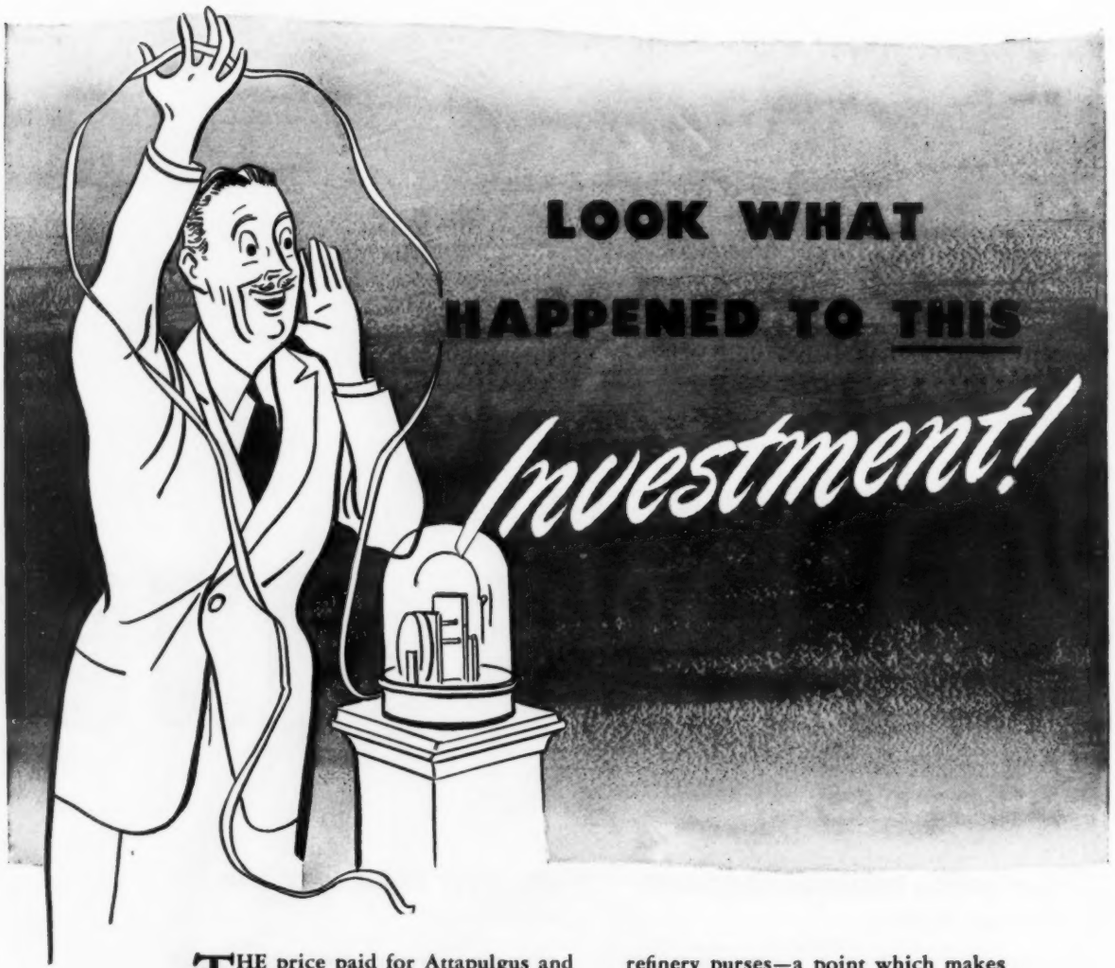
Can you, as a refiner, ask for more conclusive proof of this process as a possible solution to your vitally important problem of product improvement?

UNIVERSAL OIL PRODUCTS COMPANY

UOP

General Offices: 310 S. MICHIGAN AVENUE, CHICAGO 4, ILLINOIS, U.S.A.
Laboratories: RIVERSIDE, ILLINOIS

Universal Service Protects Your Refinery



THE price paid for Attapulgus and Porocel adsorbents is around *one cent* per pound—a fact which, we will agree, makes pretty dull reading. But for refiners using our materials, this modest investment pyramids to phenomenal returns. To be specific, each pound properly applied to petroleum stocks increases their value by at least *one dollar*—a return of 100 to 1.

Some four billion pounds of fullers earth and bauxite have been shipped to refineries by Attapulgus and Porocel—a noteworthy record of service to the industry. But what is even *more* noteworthy is the fact these materials have put four billion dollars into refinery purses—a point which makes *good* reading.

That's the record to date. It was accomplished by adsorbent-treating a wide variety of hydrocarbons to effect reduction or removal of colors, odors, tastes, moisture, sulfur, acids, fluorides and unsaturates, and for catalytic purposes. It's a record for *you* to tie to when considering plans to improve quality, expand output, or both.

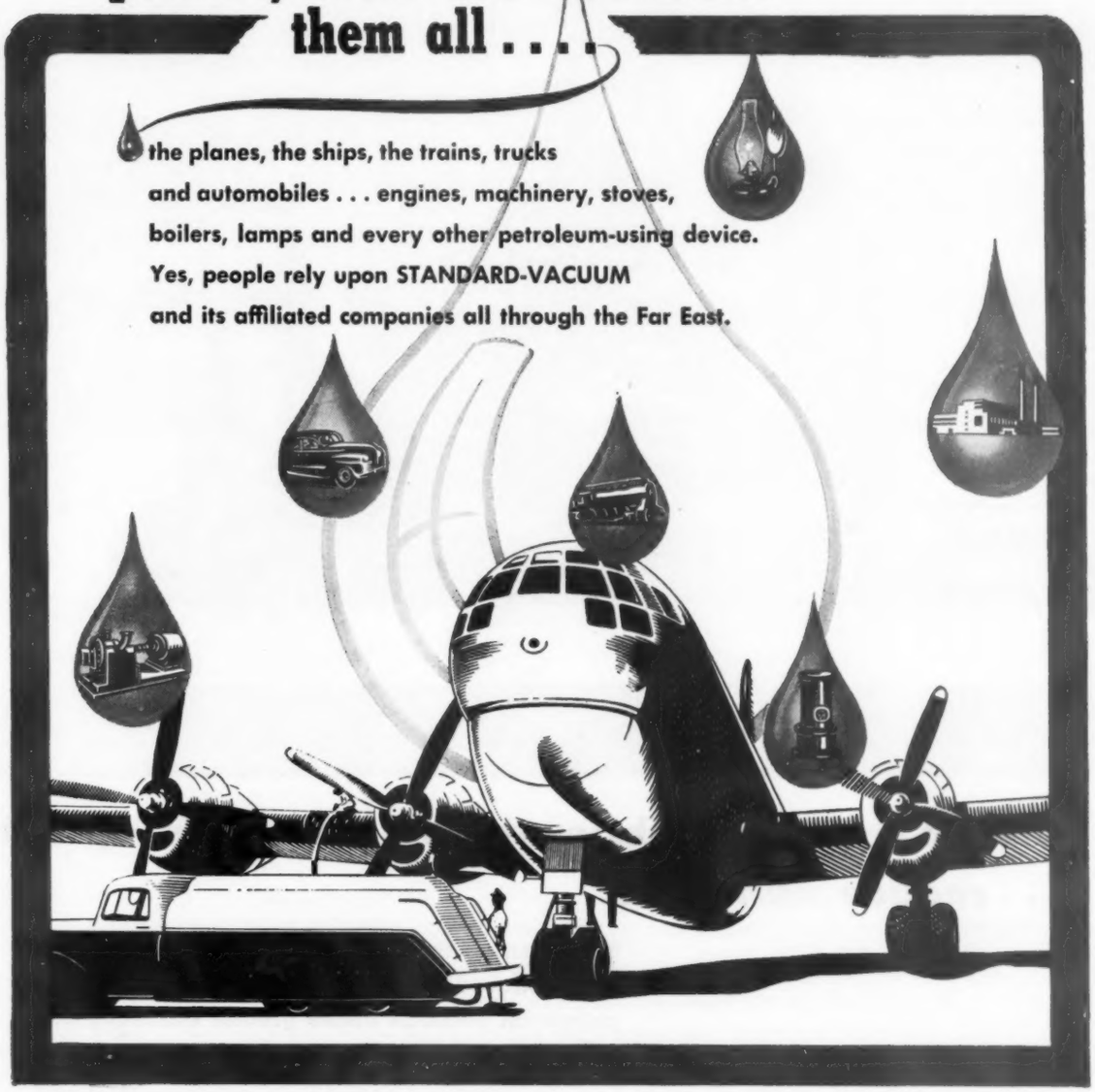
Consult with us freely. Our broad knowledge of the behavior of our products under many sets of conditions should go far in helping *you* get 100 for 1.

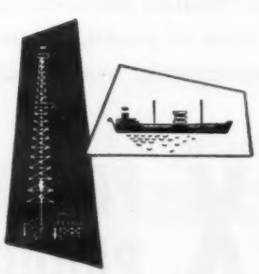
ATTAPULGUS CLAY COMPANY *Fullers Earth* · **POROCEL** CORPORATION *Activated Bauxites*

Dept. X, 210 West Washington Square, Philadelphia 5, Pa.

Standard-Vacuum

powers, fuels and lubricates them all . . . .


the planes, the ships, the trains, trucks
and automobiles . . . engines, machinery, stoves,
boilers, lamps and every other petroleum-using device.
Yes, people rely upon STANDARD-VACUUM
and its affiliated companies all through the Far East.



STANDARD-VACUUM OIL COMPANY

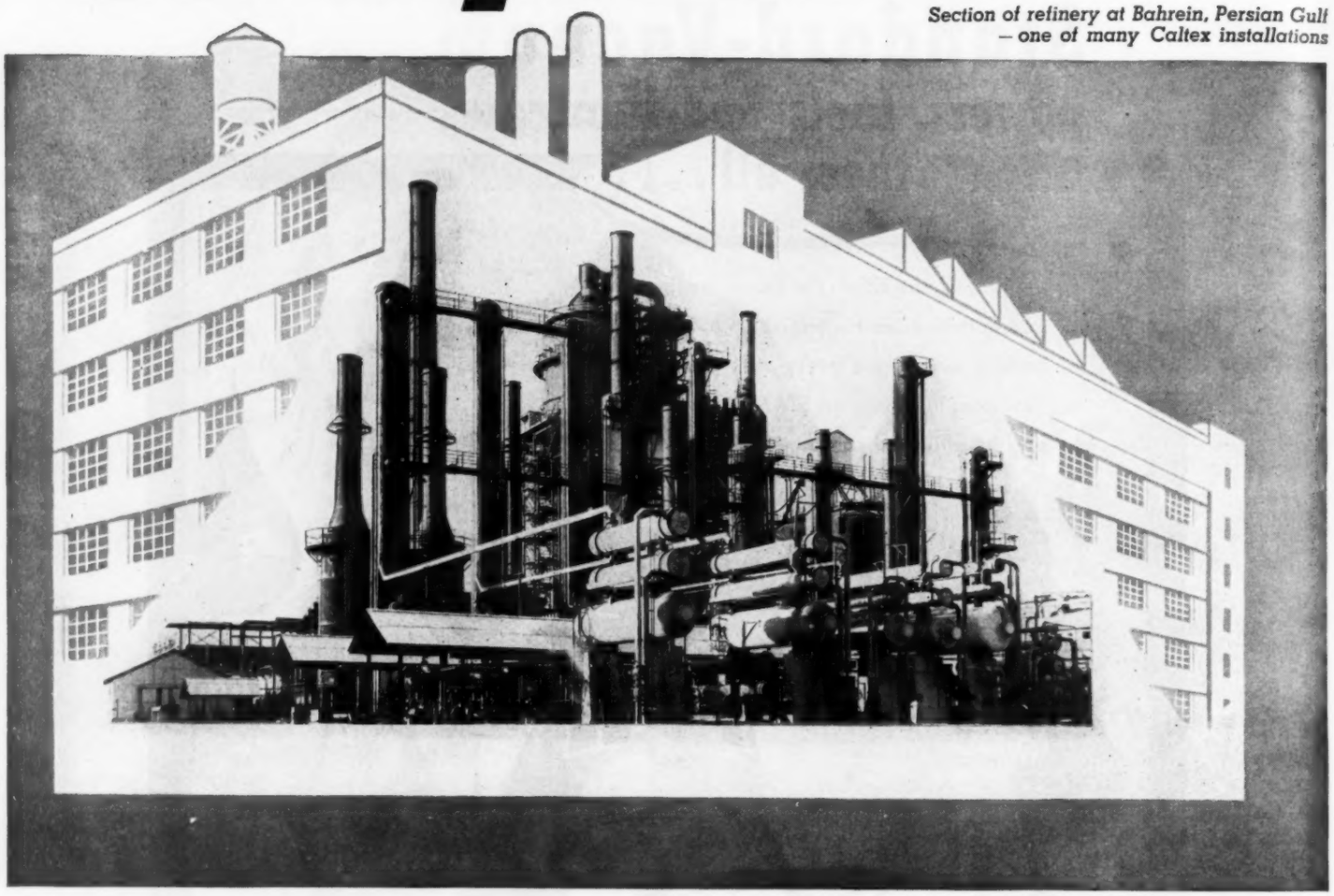
26 BROADWAY, NEW YORK 4, N. Y.

STANDARD-VACUUM and its affiliated companies serve more than half the population of the world with the petroleum products essential to their economic growth and development, in . . .

AUSTRALIA • BURMA • CEYLON • INDIA • INDO-CHINA • INDONESIA • JAPAN
KENYA • MADAGASCAR • MALAYA • NEW ZEALAND • PAKISTAN • PHILIPPINES
PORTUGUESE EAST AFRICA • RHODESIA • SOUTH PACIFIC ISLANDS
SOUTH WEST AFRICA • TANGANYIKA • THAILAND • UNION OF SOUTH AFRICA

Oil is *power*...

Section of refinery at Bahrein, Persian Gulf — one of many Caltex installations



CALTEX quality lubricants and fuels step up output ... *reduce unit costs*

REFLECTING the efficiency with which they are produced and refined, Caltex high quality petroleum products insure greater efficiency and economy in the production of industry.

Backing up its extensive production and refining facilities, Caltex also offers skilled technical aid. This assures the sound application of product to use — and so, efficiency and economy in every major field of machine production.

CALTEX REG. T. M.

CALTEX PETROLEUM PRODUCTS

Offices in U. S. A.: 551 Fifth Avenue, New York 17, N. Y.
Cable Address: "CALTEX, N. Y."

CALTEX SALES AND SERVICE IN EUROPE, AFRICA, ASIA and AUSTRALASIA

THIS MAN IS DELIVERING A *Petroleum Refinery*

He's a McKee Company Engineer, and along with the plans he carries, he delivers the specialized services and long, world-wide experience of the McKee organization. Symbolized behind him are the technical experts and skilled personnel necessary for the construction of a single processing unit.

During the past year the McKee organization had in process of completion, simultaneously, 35 petroleum refinery and iron and steel plant projects in the United States and 10 foreign countries.

Arthur G. McKee & Company has the men, the experience and the resources to undertake petroleum refinery and iron and steel plant projects of any size in any location.

ARTHUR G. McKEE & COMPANY

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

ENGINEERS AND CONTRACTORS • ESTABLISHED 1905
2300 CHESTER AVENUE, CLEVELAND
30 Rockefeller Plaza, New York, N. Y.

PUTTING THE BRAKE ON OPERATING COSTS

Wastage of working hours, consequent upon frequent renewal of Friction Linings is a big item. So 'put the brake' on operating costs by specifying Ferodo Brake & Clutch Linings and ensure smooth action and immense retardation with EXCEPTIONAL LENGTH OF LIFE.

Ferodo Linings possess characteristics essential to withstand the gruelling work imposed upon them in the Petroleum Industry: coefficients of friction to meet the wide variations in operating conditions and high resistance to scoring.

Made in all sizes, in rolls or formed to drum diameter.

FERODO

***INDUSTRIAL* BRAKE & CLUTCH LININGS**

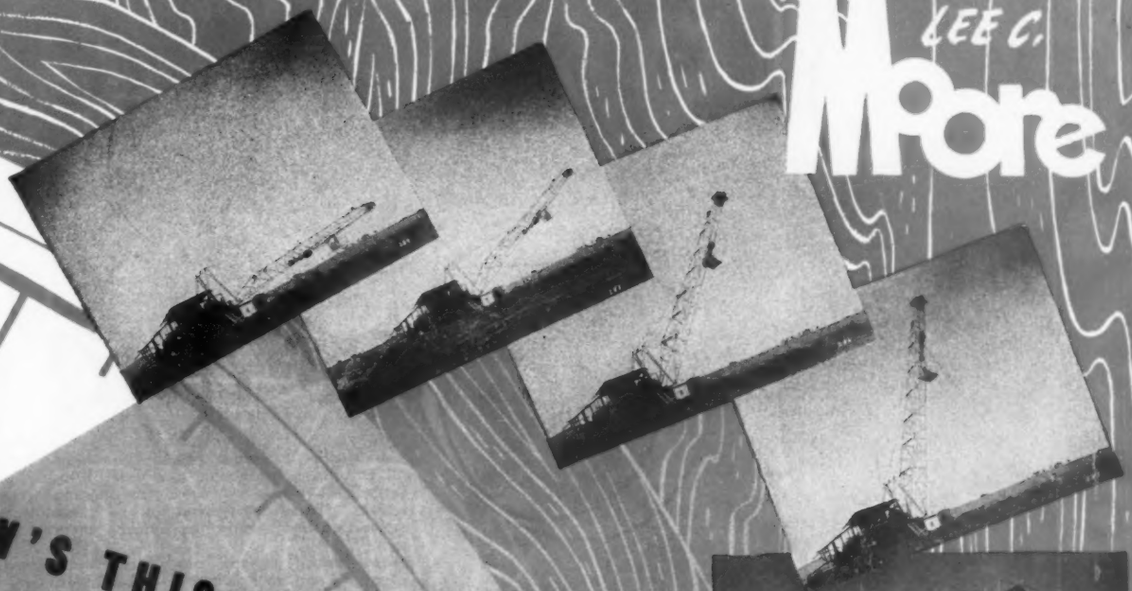
Agents for—ARGENTINE, URUGUAY and PARAGUAY: Anderson Levanti & Co., S.R. Ltda., Alsina 471/485, Buenos Aires. PERU: Milne & Co., S.A., Lima. CHILE: Balfour Lyon & Co. Ltd., P.O. Box 2-V., Valparaiso. TRINIDAD: F. J. Miller & Co. Ltd., 30 Richmond Street, Port-of-Spain. INDIA: Asbestos Cement Limited, Mulund, Bombay. PAKISTAN: Asbestos Magnesia & Friction Materials, Ltd., Karachi. BURMA: Bombay-Burmah Trading Corporation Ltd., 104 Strand Rd., Rangoon. *TRAVELLING REPRESENTATIVES—Caribbean Area:* C. L. Sharp, Esq. *Central Europe:* P. H. Grevé, Esq., Casella Postale 534, Trieste Centro, Free Territory of Trieste. CANADA and U.S.A.: *Enquiries to:* Atlas Asbestos Co. Ltd., 5600 Hochelaga Street, Montreal, Canada.

Manufacturers:

FERODO LTD., CHAPEL-EN-LE-FRITH, DERBYSHIRE, ENGLAND.

A Member of the Turner & Newall Organisation.

LEE C. Moore



HOW'S THIS FOR SPEED?

The Lee C. Moore patented Jackknife Cantilever Rotary Drilling Mast is designed for speed in transporting and erecting.

Once on location all assembling and stringing up is done on the ground. Thus, costly hours are saved from the time the mast arrives until it is ready to start making hole.

LEE C. MOORE CORPORATION

TULSA • DALLAS • HOUSTON • MIDLAND • SHREVEPORT • WICHITA • CENTRALIA • FITTSBURGH

Export Office — 9 Rockefeller Plaza, New York 20, N. Y.

30 Years ago

...a handful of oil men gathered in Washington, D. C. to discuss problems brought about by the first World War. Cooperative measures were adopted at this, the first of the yearly API meetings. On this memorable date, The Fluor Corporation, Ltd., was thirty years old and was engaged in the design and construction of equipment for the fabulous petroleum industry in California.

As the industry expanded, Fluor's facilities for equipping it kept pace and today Fluor products and services are known the world over. In addition to the 27-acre plant in Los Angeles, Fluor maintains a mid-continent gasoline division in Houston, shops at Paola, Kansas, and sales offices in New York, Boston, Pittsburgh, Tulsa, Chicago and San Francisco to serve a growing list of clients.

Fluor

DESIGNERS • CONSTRUCTORS • MANUFACTURERS

THE FLUOR CORPORATION, LTD., Los Angeles 22, California

ELECTRICAL APPARATUS

FOR EVERY INDUSTRY

The General Electric Company manufactures complete electric equipment for the generation, transmission, distribution, and utilization of electricity—including not only the apparatus shown herein, but also hydroelectric-station equipment, engine-driven generators, meters, photoelectric relays, conduit and fittings, wiring devices, lamps, etc.

These products are distributed abroad through representatives of International General Electric Company, Inc., Schenectady, New York, U. S. A.

Any user who wishes help concerning electric equipment is invited to consult our engineers in any of the principal offices listed below, or to write direct to Schenectady, New York, for additional information on products listed herein.

Australian General Electric Pty., Ltd., Sydney
Andersen, Meyer & Company, Ltd., Shanghai, China
Int. General Elec. Co. of N. Y. Ltd., Crown House, London, England
Int. Gen. Elec. Co. (India) Ltd., Thackersey House, Bombay
Int. Gen. Elec. Co., Inc. of Java, Batavia, N.E.I.
Int. Gen. Elec., S.A., Inc., San Juan, Puerto Rico
General Electric (P.I.) Inc., Port Area, Manila
So. African Gen. Elec. Co., Ltd., Johannesburg
Int. Gen. Elec. Co., Inc., St. John's, Newfoundland
N. E. & E. Co., Ltd., Wellington, New Zealand

INTERNATIONAL GENERAL ELECTRIC CO., INC.
New York, N. Y., U.S.A. Schenectady, N. Y., U.S.A.

GENERAL ELECTRIC

Presents . . . . . EQUIPMENT FOR THE OIL INDUSTRY

The Lorelei of industry, singing sweet songs of power to nations and to individuals, has lured the engineer and the business-man into the highways and byways of the world. The derricks of oil wells rise from lake and mountain, forest and desert as mute sentinels of man's economic progress.

Since the first oil well was drilled in Titusville, Pa., in 1859, the world has produced over 32 billion barrels of crude petroleum. Each year of the past few years has seen over two and one-half billion barrels produced, refined, and distributed. The drilling and pumping of wells, the refining processes of distillation, cracking, etc., the transportation of oil to and from the refinery, and the distribution of petroleum products by land and by sea today call for the use of nearly every type of electrical equipment.

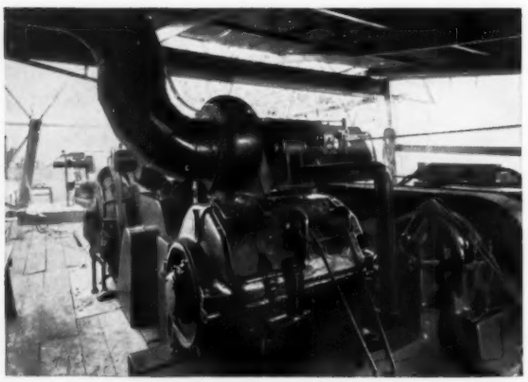
GENERAL ELECTRIC for many years has been a leader in the development of all types of electric equipment of outstanding quality and dependability for drilling, pumping, refining and transportation. Not only has the oil industry found that the G.E. monogram means assurance of reliability, but also oil men have found General Electric engineers ready at all times to co-operate in designing and applying electric equipment that would meet special conditions of service.

The General Electric Company manufactures complete electric equipment for the generation, transmission, distribution, and utilization of power in the oil industry. In addition to the apparatus listed, it builds steam turbines, turbine-generators, capacitors, switchgear, lightning arresters, oil circuit breakers, control equipment for all types of motors, meters, recording instruments, selsyns, copper-oxide rectifiers, heating devices, photoelectric relays, wire, conduit, etc.

DIRECT-CURRENT ROTARY-DRILLING EQUIPMENT

The use of direct-current equipment for rotary drilling is one of the most modern developments in the oil fields. It provides the drilling rig with the extreme flexibility and highly efficient speed control afforded by direct-current motors, and with the same wide speed range and torque-speed characteristics as with steam-engine drive. The motors are operated by the well-known system of generator-voltage control, thus requiring direct-current generators at each rig. These may be driven by alternating-current motors, and thus operate from central-station power, or by internal-combustion engines, making the system highly desirable for locations not economically reached by electric-power service.

Equipment can be furnished with any capacity desired, from light rigs for shallow wells, to high-powered rigs for drilling by the most modern methods in deep territory.



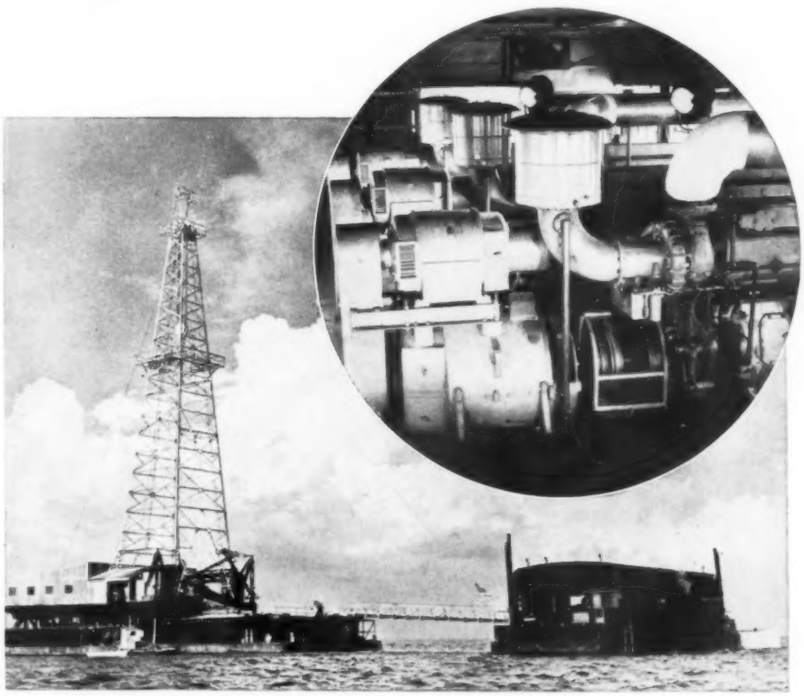
G-E 700-hp (intermittent rating), direct-current draw-works motor, Type MDP, of Fain Drilling Co.

G-E portable generating set with control for d-c rotary-drilling rig.

DIRECT-CURRENT ROTARY-DRILLING EQUIPMENT cont.

Electric drive is especially suitable for off-shore drilling projects because of the relative ease of transmitting power electrically through flexible cables from the power barge to the drilling rig.

The diesel-electric rig combines the fuel and water economy of the diesel engine or turbine with the superior flexibility of control of the d-c electric drive.



The G-E engine governor control is one of the most outstanding features of the G-E control for engine-electric drilling rigs. Located on each engine, it provides for automatic reduction of the engine speed when drilling conditions permit. This contributes to reduced engine maintenance and longer engine life.

Three 500 KW G-E generators with top-mounted exciters driven by diesel engines with G-E governor control located on the power barge shown.

OIL-WELL PUMPING

G-E well-pumping motor with control unit on pole.

With this new G-E motor-and-control team, you can coax along wells which do best when pumped slowly for long periods. You can step up the pace of those that can take it. In fact, you can tailor the pumping of any individual well to insure maximum life and yield.

You simply preset the proper pumping cycle on the G-E starter. Its built-in timing mechanism does the rest, automatically starting and stopping the pump. By eliminating the need for frequent supervision, one pumper can cover more wells and devote more time to other important duties.

From the standpoint of pumping life, G-E splashproof motors also offer this definite advantage: they possess electrical characteristics which act to cushion the shock and strain of reciprocating motion. Moreover, mechanically, these motors are well protected from wear, weather, and electrical breakdown.

G-E application engineers are ready to help you in selecting motors and control to fit your specific conditions.

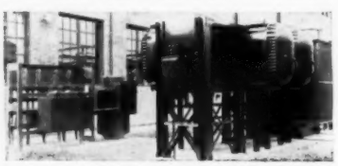
General Electric factory-assembled magnetic control, specially designed for oil-well pumping service, incorporates complete electrical protection for the motor, ample protection against weather, and provision for automatic intermittent operation of the pumping unit. Each control consists of a fusible disconnecting switch, a triple-pole magnetic switch with temperature overload relays, a manually reset under-voltage relay, a time switch, a "Hand-Off-Automatic" transfer switch, and a service protector against lightning, all enclosed in a weather-resisting cabinet arranged for pole or wall mounting.

With this equipment, it is possible to pump intermittently for predetermined periods to meet proration or well requirements. This is done automatically by the proper setting of the time switch.

Courtesy of Lane Wells Co. Night view of oil field illuminated by G-E lighting equipment.

REFINING

2 G-E 5000-kw double automatic extraction turbines and switchgear. Atzcapotzalco Refinery, Mexico.



G-E outdoor explosion-proof unit substation. Atzcapotzalco Refinery, Mexico.

3 G-E 35-hp vertical, squirrel-cage motors driving circulation impellers in oil-cracking process.

Oil-refinery requirements are wide and varied. Pumps of every class, both high- and low-pressure, for oil, water, brine, acid, and oil products are in general use. Turbines, power station auxiliaries, fans and blowers, compressors, centrifuges, process machinery, automatic process timing control, Cottrell-precipitation apparatus, material handling equipment, yard locomotives, and car spotters are only a few of the host of applications in refineries. In oil refineries, continuity of power supply is an absolute necessity for maintaining operation of vital processes in order to minimize hazards and assure uniformity of products.

During the rapid growth of the petroleum industry, G-E engineers, trained in application and research, have assisted in many original developments and have kept pace with its evolution.

TRANSPORTATION AND MARKETING

Electric Welding Pipe Line

Oil tanker fully equipped with G-E electric equipment

Gasoline pump motor
(filling station)

G-E motors driving gathering and pipe-line pumps keep the oil and gasoline flowing through a large part of the country's pipe-line network.

Many of the modern oil-tankers are powered with G-E equipment, including turbines, turbine-generators, motors, switchgear and control.

Hundreds of miles of pipe lines have been welded with G-E welders and electrodes, single-operator, direct-current welders, both motor and engine driven.

BULLETINS

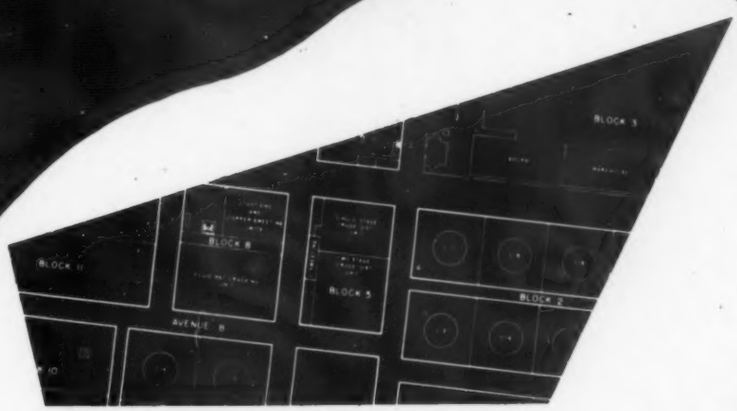
Supplying the Nation's Oil Electrically	GED-825
Electric Equipment for D-c Engine-Driven Drilling Rigs	GEA-4456
Armored Mill Motors	GEA-4654
Electric Equipment for Aviation-Gasoline Refineries	GES-3147
Air Circuit Breakers in Explosion-Proof Boxes	GEA-3447
Unit Substations—600 v. and below	GEA-3592
Load Center Unit Substations For Semihazardous Locations	GEA-4085
Metal-Clad Switchgear up to 5000 v.	GEA-2249
New Limitamp Controllers	GEA-4247
New Low-Voltage Oil-Immersed Starters	GEA-3541
Air Break Explosion-Proof Starters	GEA-3704
A-c Arc Welders (English)	GEA-4081
A-c Arc Welders (Spanish)	IGE-S-3549
D-c Arc Welders (English)	GEA-1440
D-c Arc Welders (Spanish)	IGE-S-3544
Condensed Motor Catalogue (English)	GEA-4281
Condensed Motor Catalogue (Spanish)	IGE-S-3593
Synchronous Motors (Spanish)	IGE-S-3537
Tri-Clad Induction Motors (Spanish)	IGE-S-3543
Carboloy Tool Catalogue (English)	GT-475R
Carboloy Tool Catalogue (Spanish)	IGE-S-3556
Capacitors—Low Voltage Industrial	GEA-2742
Capacitors—High Voltage Industrial	GEA-2860
Diesel Electric Industrial Locomotives	GED-1113
Complete List of Publications covering Industrial Electronic Applications	IGE-3637
Steam Turbine-Generators	GEA-3277
Induction Motor Generators	GEA-3990
Novalux Floodlights	GEC-346
Automatic Process-Timing Control	GEA-4181
Co-ordinating Electric Pipe-Line Pumping Equipment	GEA-3858
Air Circuit Breakers	GEA-3642
Oil-Well Pump Starters	GEA-3805
Tri-Clad Open (Dripproof) Polyphase Induction Motors	GEC-264
Totally Enclosed Induction Motors with Surface Air Coolers	GEA-3109
Unit-Cooled Direct-Current Motor	GEA-4469
Thyrite Controlled D-c Generators	GEA-4471
Explosion-Proof Motors	GEC-221

GENERAL ELECTRIC

PRODUCTS OF GENERAL ELECTRIC CO., U.S.A.

PRINTED IN U.S.A.

refiners dream, too . .



. . . of an ideal refinery layout . . . of a low-cost catalytic cracking unit . . . of new processes to keep pace with the ever-increasing Octane requirements . . . of a new crude unit, etc., . . . etc., . . . etc. . . .

Working with refiners throughout the world, for over 30 years, converting such ideal images—over 500 of them—into physical reality has been the job of the complete engineering and construction service—FOSTER WHEELER.

FOSTER WHEELER CORPORATION

165 BROADWAY, NEW YORK 6, NEW YORK

ONCE...these were but dreams

NOW . . . in Texas, a complete chemical plant is operating.

NOW...in Spain, a complete lube refinery is producing superior lubricants.

NOW...in England, construction moves along rapidly on the largest refinery in Europe.

Substantial proof that where there's a will— there's a way. We suggest the FOSTER WHEELER way.

FOSTER WHEELER CORPORATION

165 BROADWAY, NEW YORK 6, NEW YORK

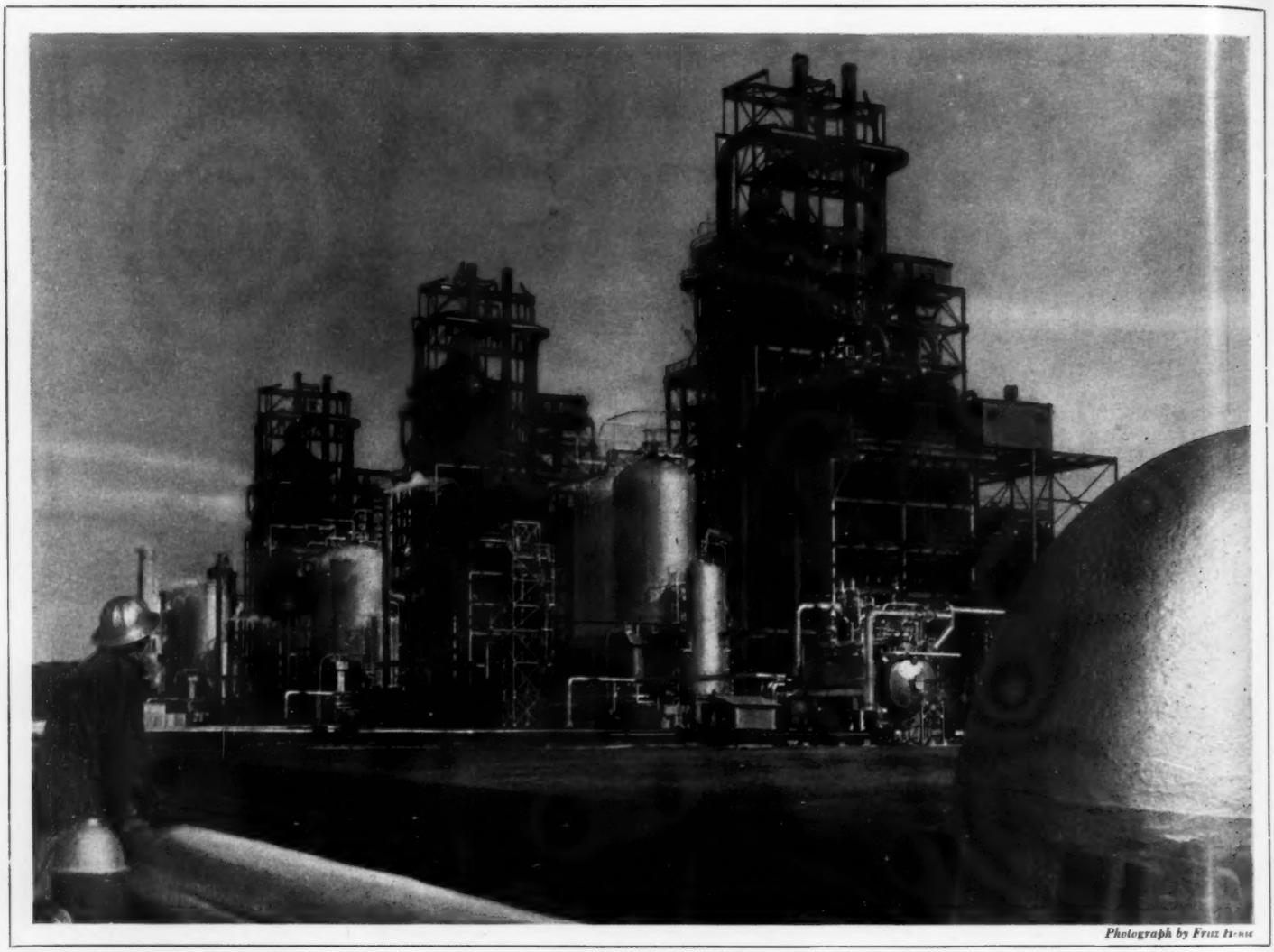
...pack in Steel Drums for Safety

Make sure your goods, however transported, arrive complete as despatched. We make Steel Drums for storage and transport of many kinds of goods, in powder, solid, semi-solid and liquid form. They are built to stand any sort of handling, and absolutely sealed against leakage or undetected tampering in transit. Our experts are always ready to assist you with your packaging problems.

METAL CONTAINERS

METAL CONTAINERS LTD., 17 WATERLOO PLACE, PALL MALL, LONDON
WORKS : ELLESMERE PORT & RENFREW ASSOCIATED COMPANIES OVERSEAS

M-W.98



Photograph by Fritz Henle

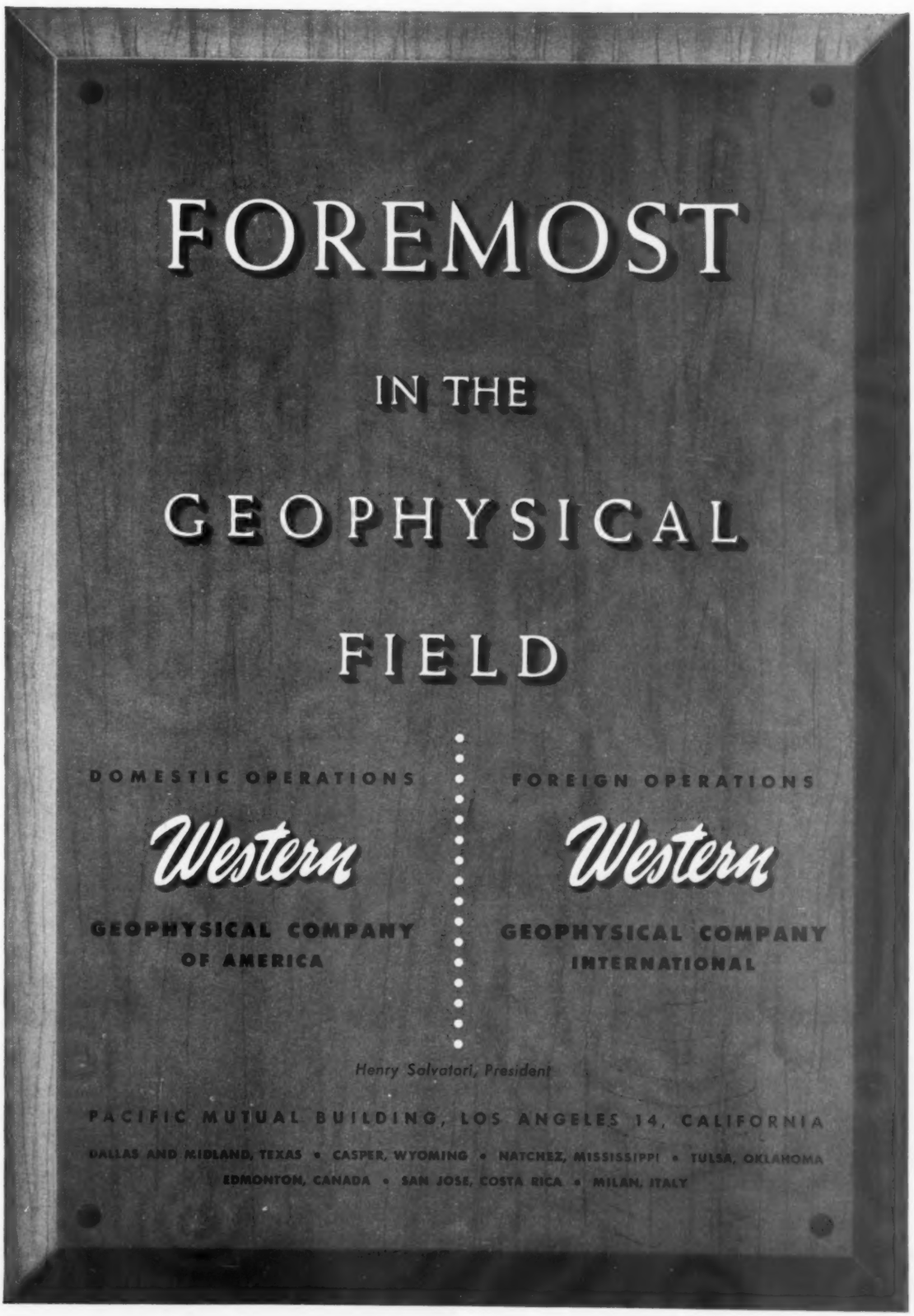
Progress through Dreams

When the Cities Service refinery at Lake Charles, Louisiana, was dedicated in 1944—in time to be of vital service in the war—one petroleum writer described it as a "composite dream of a group of refiners old in experience and service."

Dreams of this kind pay off. It is because of such dreaming that the American petroleum industry has advanced in half a century from comparative littleness to its present place among the top four of American industrial giants. Where once it was concerned mainly with the production of kerosene, today it provides the ingredients for more than 2,600 useful products—and the end is not yet.

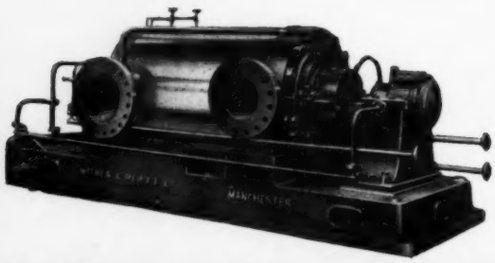
Looking forward, the petroleum industry, since World War II, has been spending two billions a year on expansion and development of all phases of the industry—$100,000,000 for research alone. That's why, even though it had this great plant at Lake Charles, Cities Service has gone ahead with the investment of many millions of dollars in modernizing other refineries, and expanding in other directions. We're still dreaming . . . still making dreams come true. Fortunately we live in a land where dreams are still not regarded as a waste of human effort!

CITIES SERVICE


FOREMOST
IN THE
GEOPHYSICAL
FIELD
DOMESTIC OPERATIONS
Western
GEOPHYSICAL COMPANY
OF AMERICA
FOREIGN OPERATIONS
Western
GEOPHYSICAL COMPANY
INTERNATIONAL
Henry Salvatori, President
PACIFIC MUTUAL BUILDING, LOS ANGELES 14, CALIFORNIA
DALLAS AND MIDLAND, TEXAS • CASPER, WYOMING • NATCHEZ, MISSISSIPPI • TULSA, OKLAHOMA
EDMONTON, CANADA • SAN JOSE, COSTA RICA • MILAN, ITALY

Centrifugal Pumps
& FLAMEPROOF MOTORS

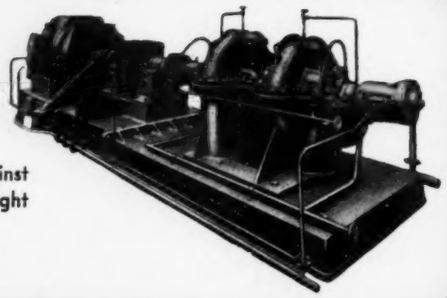
Main Pipeline Pumps....



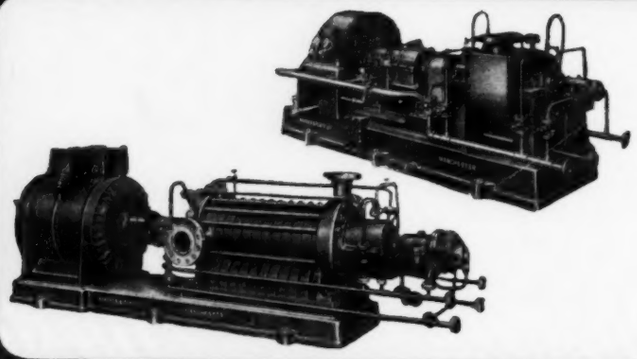
Mather & Platt multi-stage 'Plurovane' pumps were amongst the earliest centrifugal pumps installed for main line work. The pump shown on the left is a typical modern 'Plurovane' designed for a throughput of 50,000 bbls/day of crude oil against a pressure of 750 p.s.i. when running at 1500 r.p.m.

Transfer and Loading Pumps

Our standard ranges include a pump for nearly every transfer or loading duty. The two-stage "Medivane" pump illustrated on the right can handle 700 tons/hr. of crude or products against heads up to 500 ft. It is driven through a gas tight wallbox by a 550 h.p. Mather & Platt Motor.



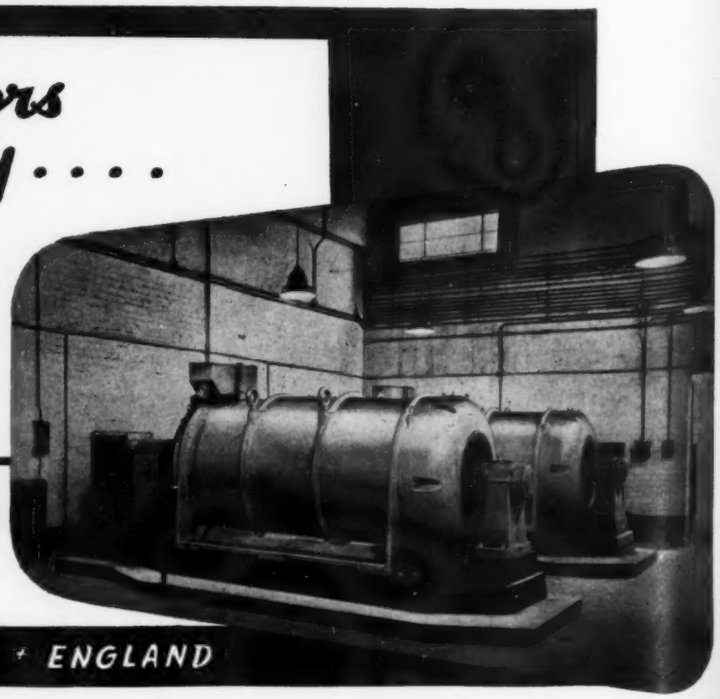
Refinery Process Pumps



Our long refinery experience at home and abroad enables us to supply pumps for the most arduous refinery duties. The illustration shows typical units:—a steam turbine driven pump handling oil at 500 degs. F. and a motor driven "Plurovane" pump dealing with light volatile hydrocarbons.

Flameproof Motors on Pipeline Duty....

Mather & Platt electrically-driven centrifugal pumps on an oil pipe line. The motors here illustrated are of the totally enclosed flameproof type, and are of 1,000 h.p. capacity, fed from a 3 phase 50 cycle 6000/6600 volt supply. They are squirrel cage direct-on started machines with a starting current of four times full load value.



MATHER & PLATT

LIMITED

PARK WORKS · MANCHESTER, 10 · ENGLAND

There they go—laying 56 miles of 34-inch pipe line in a month's time! Records fall to the mechanized attack of Bechtel crews who, this year alone, will complete more than 1700 miles of oil and gas pipe lines ranging from 20" to 34" in diameter.

BECHTEL CORPORATION

Los Angeles • **SAN FRANCISCO** • *New York*
Tulsa

"BUILDERS FOR INDUSTRY"

DESIGN • ENGINEERING • CONSTRUCTION

BIGNESS

COMES IN HANDY!

In Peace—In War!

PEARL HARBOR surprised and shocked America. What happened after that surprised and *flattened* the Axis!

American industry demonstrated the amazing ability of its big companies to expand swiftly and efficiently to meet any need!

In Petroleum, companies like Socony-Vacuum with armies of technicians and workers, vast modern equipment, converted almost overnight to war production.

For example, by March, 1945, the wartime peak, the petroleum industry had increased annual output of aviation fuels (all grades) by more than 40 times over 1940! And during the same period, Socony-Vacuum *multiplied, by over 70 times*, its output of special high octane aviation gasoline, one of U. S. A.'s most potent weapons of World War II . . . with volume zooming from less than 300,000 barrels a year to a staggering rate of 20,000,000 barrels!

Today, by public demand, America is producing petroleum products at the yearly rate of over 2,080,000,000 barrels—and Socony-Vacuum is proud of the bigness that enables it to do its part.

The Flying Red Horse Companies

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:

MAGNOLIA PETROLEUM COMPANY • GENERAL PETROLEUM CORPORATION

SOCONY-VACUUM

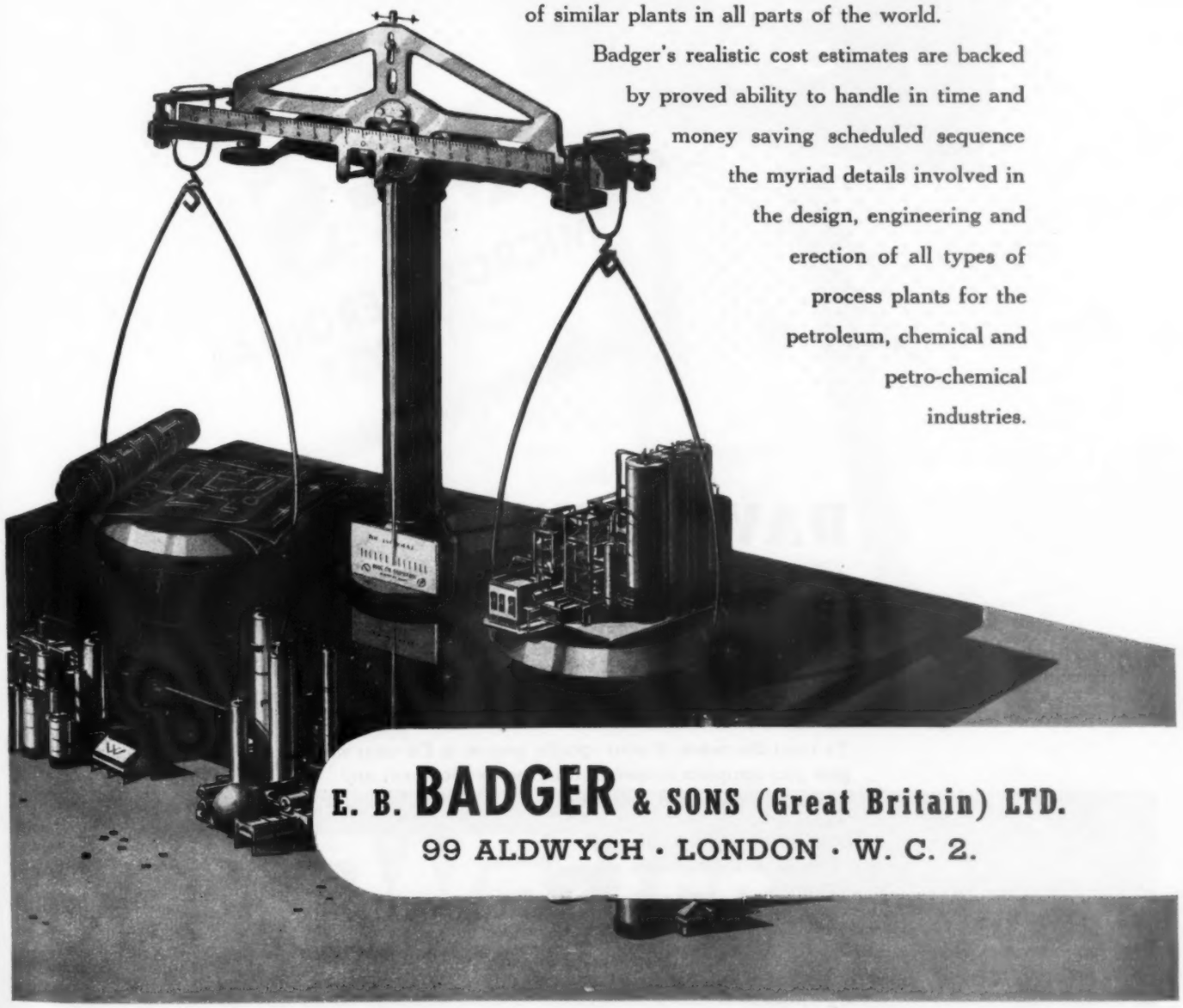
BIGNESS SERVES AMERICA—PROTECTS AMERICA!

"Guesstimate" or ESTIMATE

Before considering plant expansion or new construction, manufacturers in the process industries must have assurance today that the final cost of a new plant will bear reasonable relationship to the initial appropriation.

Badger is able to give valuable assistance in making rational and adequate estimates of cost, based on current experience in the design and construction of similar plants in all parts of the world.

Badger's realistic cost estimates are backed by proved ability to handle in time and money saving scheduled sequence the myriad details involved in the design, engineering and erection of all types of process plants for the petroleum, chemical and petro-chemical industries.



E. B. BADGER & SONS (Great Britain) LTD.

99 ALDWYCH · LONDON · W. C. 2.

PROCESS ENGINEERS and CONSTRUCTORS for the PETROLEUM, CHEMICAL and PETRO-CHEMICAL INDUSTRIES

DAVISON

SYNTHETIC FLUID TYPE CRACKING CATALYSTS

Your requirements for synthetic fluid type cracking catalyst can now be supplied by Davison in either microspheroidal or ground form. Both are available in various grades . . . and are backed by Davison's experience as producers of catalysts since the installation of the *first* fluid cracking catalyst plant.

To meet the needs of your specific processes, Davison will give you complete cooperation in the development and production of special catalysts.

*T.M.T.D.C.C.

Progress through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

these 4 BOWENS

Can Meet Most of Your Fishing Needs

With these four Bowen tools you're ready for almost every type of fishing work encountered on a drilling rig. Look these tools over carefully and see for yourself how they meet your standards of safety and fool-proof operations on toughest jobs.

The Bowen Safety Joint

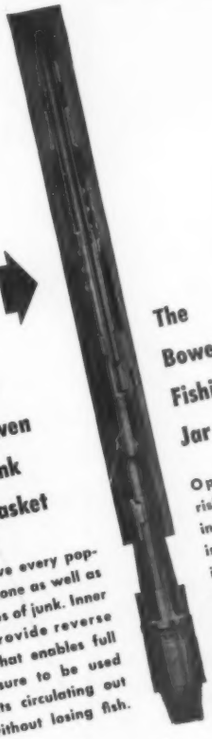
A readily releasable connection for either drilling or fishing . . . delivers full torque capacity of string in either direction . . . has only four simple parts—box and pin sections and packers.

The Bowen Releasing Overshot

Catches drill pipe, couplings or tool joint without making any adjustments . . . utilizes exclusive grapples that cinch tighter as pull increases . . . is easily released at any time.

The Bowen Junk Basket

Made to retrieve every popular type bit cone as well as all small pieces of junk. Inner passages provide reverse circulation that enables full pump pressure to be used and permits circulating out of hole without losing fish.



The Bowen Fishing Jar

Operates without risky twisting or turning of the string . . . is fully adjustable for intensity of blow while in the hole . . . is fast in operation . . . and built for the hardest jarring jobs.

Your 1950

COMPOSITE CATALOG

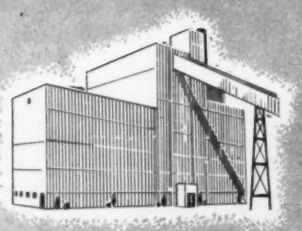
contains full descriptions and illustrations of these and many more tools in the complete Bowen line, or write for your copy of The Bowen Catalog. No obligation at all. Make Bowen Tools your guide to safer, more efficient, more economical operations when fishing jobs come your way!

SR BOWEN CO

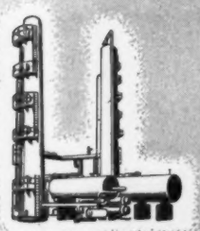
MAIN OFFICE AND PLANT:
11008 SOUTH NORWALK BOULEVARD
SANTA FE SPRINGS, CALIFORNIA

EXPORT OFFICE:
30 ROCKEFELLER PLAZA
NEW YORK CITY, NEW YORK

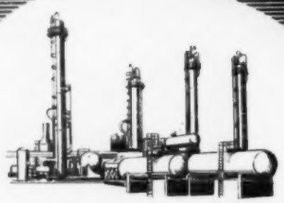
EXPORT REPRESENTATIVE: VAL R. WITTICH, JR.



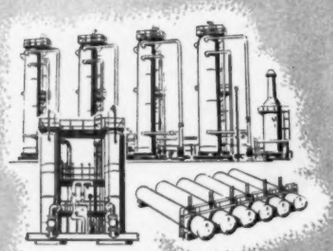
POWER DIVISION



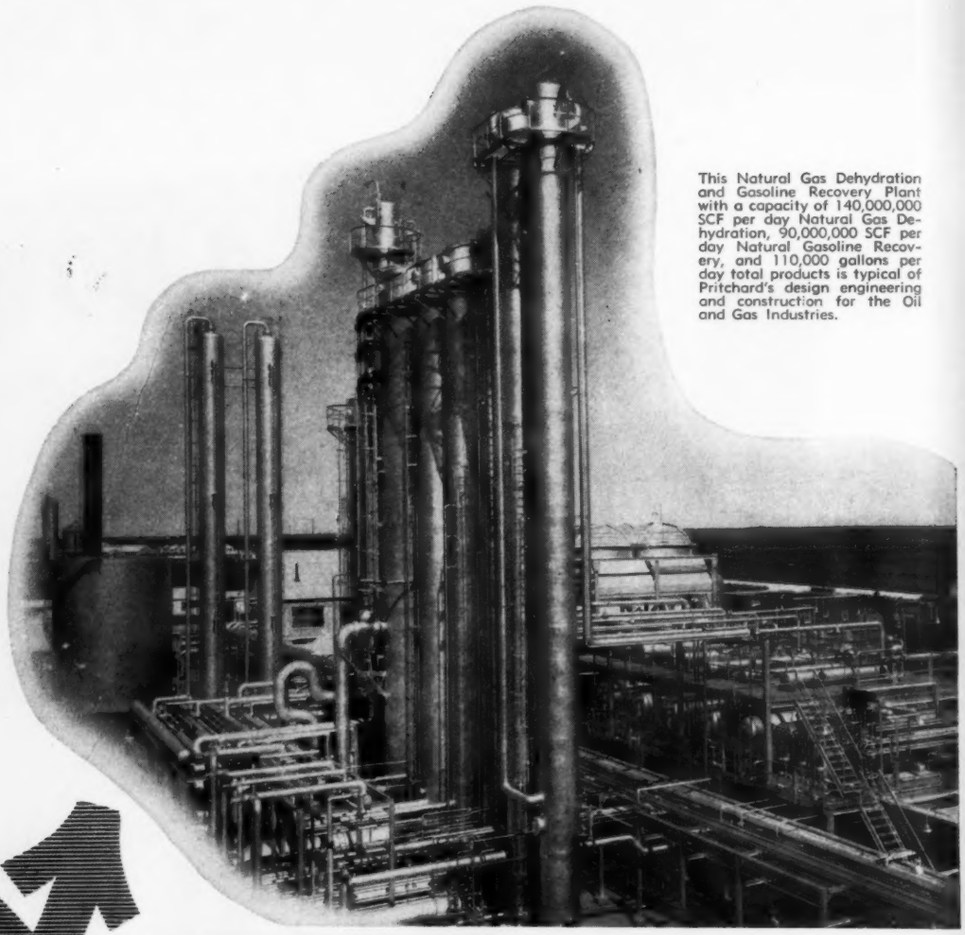
CHEMICAL DIVISION



PETROLEUM DIVISION



NATURAL GAS DIVISION



This Natural Gas Dehydration and Gasoline Recovery Plant with a capacity of 140,000,000 SCF per day Natural Gas Dehydration, 90,000,000 SCF per day Natural Gasoline Recovery, and 110,000 gallons per day total products is typical of Pritchard's design engineering and construction for the Oil and Gas Industries.

PRITCHARD BUILDS

Profitable Plants for Industry

In terms of sound design, engineering and construction — in terms of higher profits and freedom from trouble — Pritchard built plants are becoming known throughout the industry for their operational efficiency and quality of production.

Pritchard services include Analysis of your Requirements, Economic Studies, Design, Processing, Engineering, Purchasing, Field Construction, Guarantees and Operating Tests. Firm prices quoted on a "Turnkey" basis.

We invite you to make use of Pritchard's diversified experience in the petroleum processing field to build profit-producing plants for you.

Detailed information available on request.

Write for *FREE* Bulletins!

NATIONAL ASSOCIATION OF CONSTRUCTORS ASSOCIATION MEMBER

DESIGN ENGINEERING and CONSTRUCTION for INDUSTRY

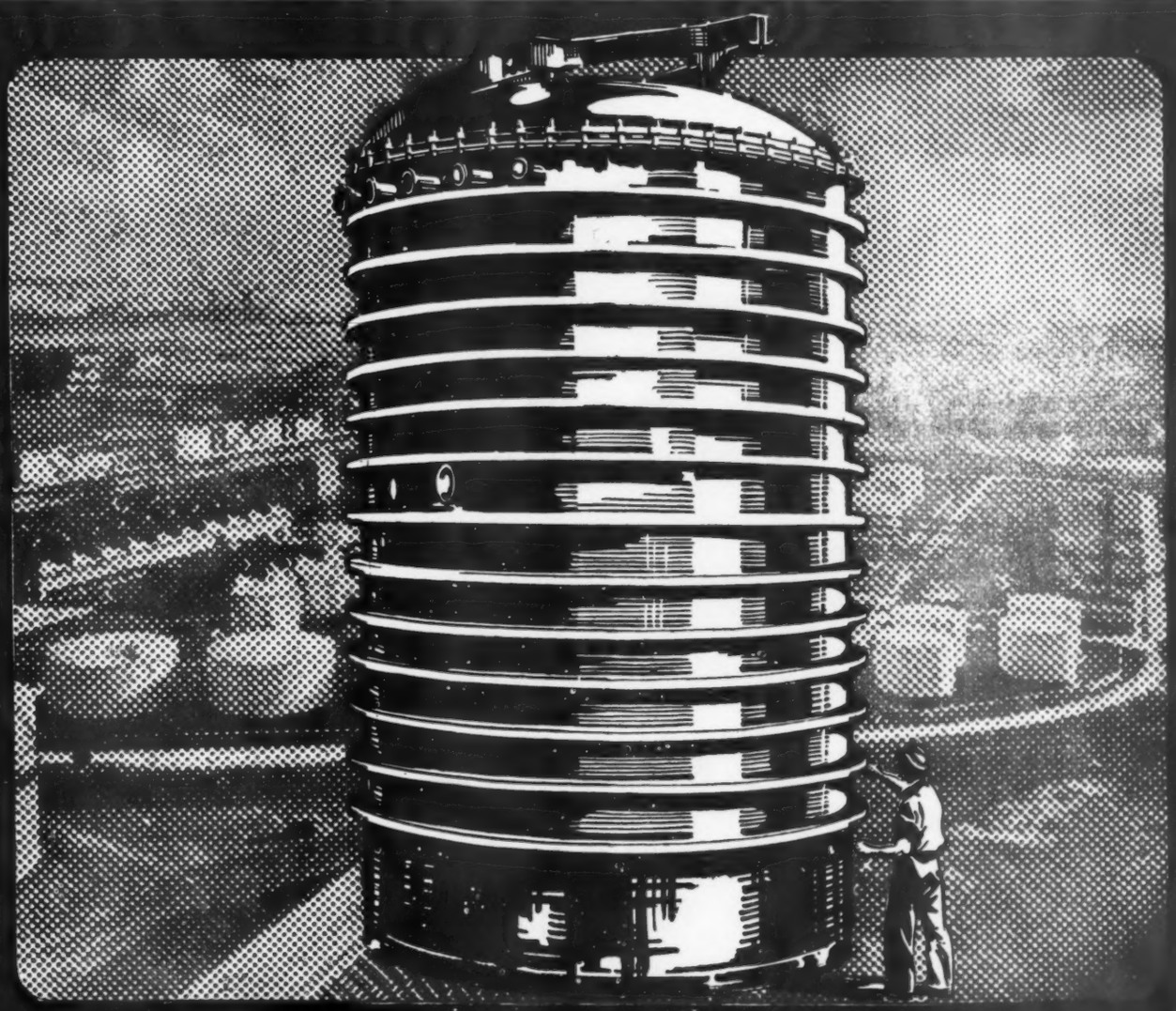
J.F. Pritchard & Co.

DESIGN • ENGINEERING • CONSTRUCTION

Dept. No. 38 908 Grand Ave., Kansas City 6, Mo.

District Offices:
CHICAGO • HOUSTON • NEW YORK • PITTSBURGH • TULSA • ST. LOUIS

Yours the problem - Harveys the answer!



Because Harveys specialise in the fabrication of Pressure Vessels for the Industrial and Chemical Trades. Modern welding equipment, and an experienced staff are available for Pressure Vessel manufacture to any of the recognised codes, including A.O.T.C., Lloyds, A.P.I. and A.S.M.E. with if necessary, X-ray examination and stress relieving by heat treatment.

Harveys fabricate from mild or alloy steels, nickel and clad steel. Shop assemblies range from a few inches to 15' 0" in diameter, pressures from absolute to 3,000 lbs. per sq. in.

If you have plant to be built, consult Harveys for all items of welded plate work. High grade designs can be developed from your specifications. A typical example is the welded Mild Steel pressure vessel illustrated here.

Write for Catalogue WP 750.

Harvey

G. A. Harvey & Co. (London) Ltd. Woolwich Road. London, S.E.7

Gas engines, too must be kept clean

USE GULFLUBE MOTOR OIL H.D.

The heavy duty detergent oil for tough lubricating jobs

Here's an oil that offers "behind-the-ears" cleaning action for power cylinders in oil field pumping units — Gulflube Motor Oil H. D. It helps keep valves and rings clean and free—prevents formation of harmful deposits on internal engine surfaces.

Gulflube Motor Oil H.D. is a quality heavy-duty detergent oil, performance proven in thousands of automotive, industrial, and marine engines. It's the ideal oil for tough lubricating jobs.

You get an important plus value when you use Gulflube Motor Oil H.D.: the helpful counsel of Gulf Lubrication Engineers, specialists in scientific gas engine lubrication. Write, wire, or phone to:

GULF OIL CORPORATION · GULF REFINING COMPANY

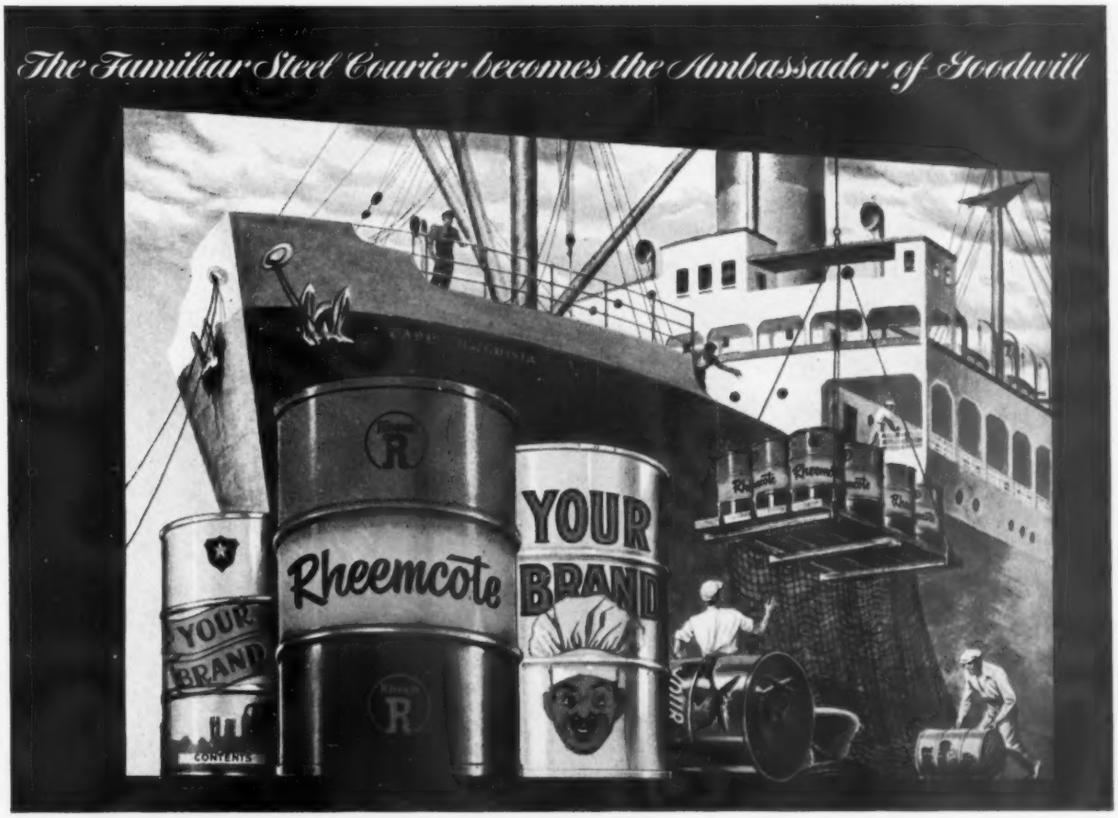
GULF BUILDING, PITTSBURGH, PA.

Sales Offices - Warehouses

Located in principal cities and towns throughout Gulf's marketing territory

GULF

The Familiar Steel Courier becomes the Ambassador of Goodwill



NOW! COLOR PACKAGING FOR LARGEST STEEL SHIPPING CONTAINER!

New RHEEMCOTE Process Produces First Completely Lithographed and Inner Roller-Coated 55-Gallon Steel Drum

Color schemes, trademarks and designs, however intricate, may now be accurately reproduced on the biggest of all steel shipping containers.

Striking possibilities of the new, exclusive *Rheemcote* process, as shown above, are the result of years of Rheem research—and development of the world's largest metal-decorating press.

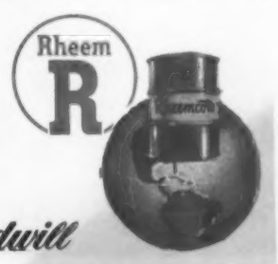
Remarkable for its merchandising value alone, the *Rheemcote* drum not only promotes—*it protects!*

A roller-coated lacquer lining seals the inner drum surface with glass-like purity . . . and thus opens the door to improved packaging for products which heretofore have been difficult to contain. New electric "Resistance" welding produces smooth, strong seams, eliminates scale and burn-off metal. A hard, lustrous, exterior finish assures utmost durability against severe weather and handling.

Users of steel containers may at last achieve uniformity of packaging – and the opportunity to billboard their products and name before the eyes of the world!

The Rheem Manufacturing Company, world's largest maker of steel shipping containers, is particularly proud to have developed the Rheemcote Process in this its 25th year of service to industry.

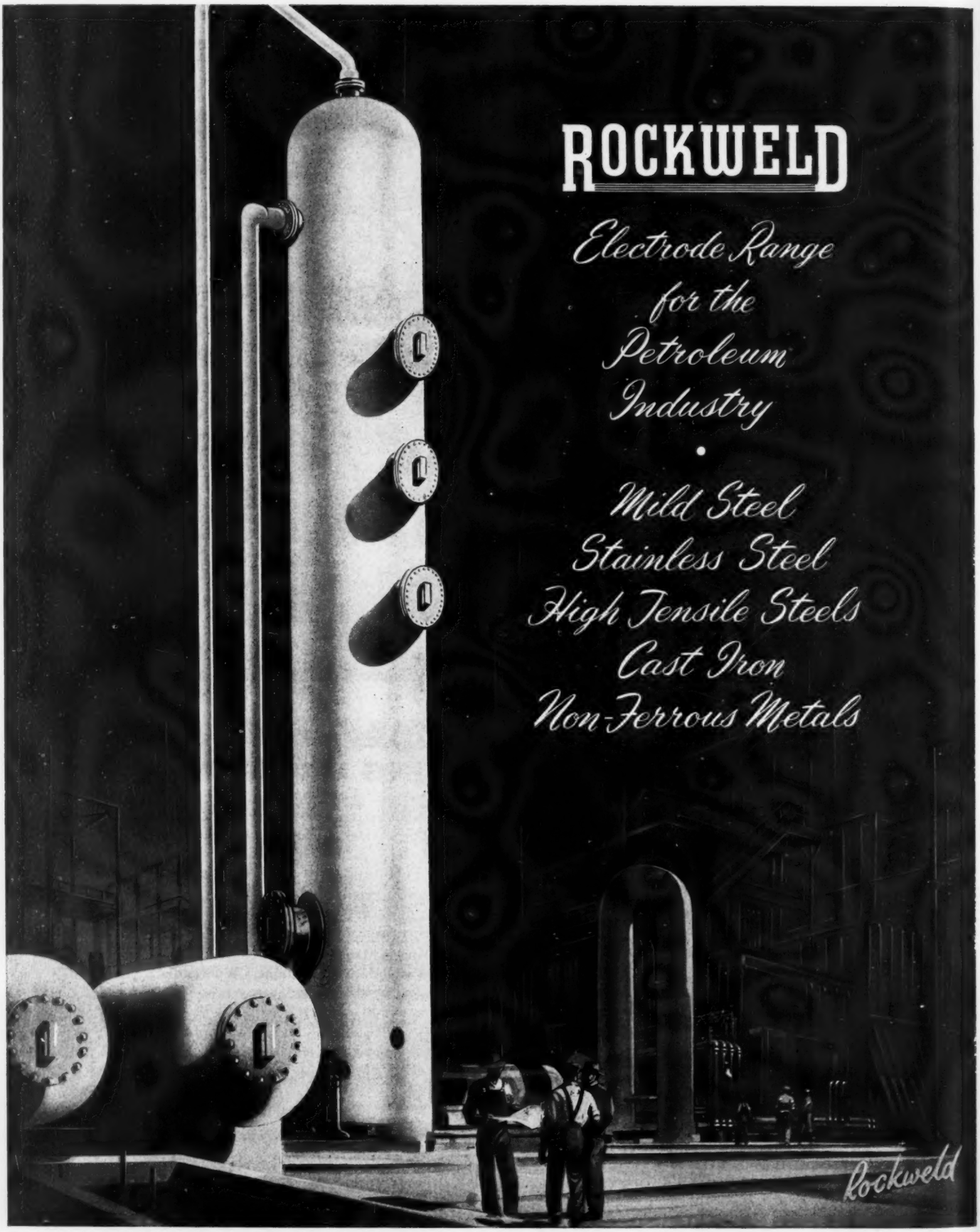
For a descriptive, beautifully illustrated brochure on this important contribution to marketing—write direct to Rheem today. No cost or obligation, of course.



RHEEM MANUFACTURING COMPANY • 570 LEXINGTON AVENUE, NEW YORK 22, N. Y.
Plants and Affiliates Throughout The World

Rely on Rheem to Deliver Your Goods..and Goodwill

©1950



ROCKWELD LTD · COMMERCE WAY · CROYDON · SURREY · ENGLAND Grams: ROCKWELD · PHONE · CROYDON · ENGLAND

Speeds Work from Prospecting to Pipeline

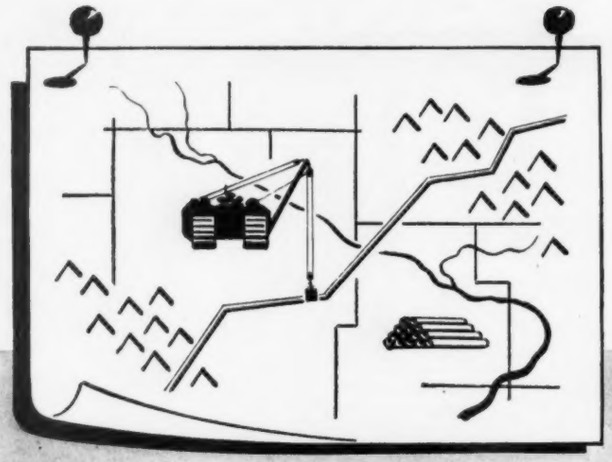
Built for rugged, off-the-road service, the 4-Wheel-Drive Willys Station Wagon is a big help to exploration parties and pipeline workers.

With 4-wheel-drive traction and high-compression "Hurricane" engine, it has the pulling power needed to get men and materials through to hard-to-reach places. Six passengers can ride in this car —and there is plenty of space for supplies and equipment. Still more load space is gained by removing the rear seats. The rear door swings down flush with the floor, making bulky objects easier to load. The 4-Wheel-Drive Willys Station Wagon is ideal for personal transportation and light hauling *anywhere* in the oil field.

4-Wheel-Drive WILLYS Station Wagon

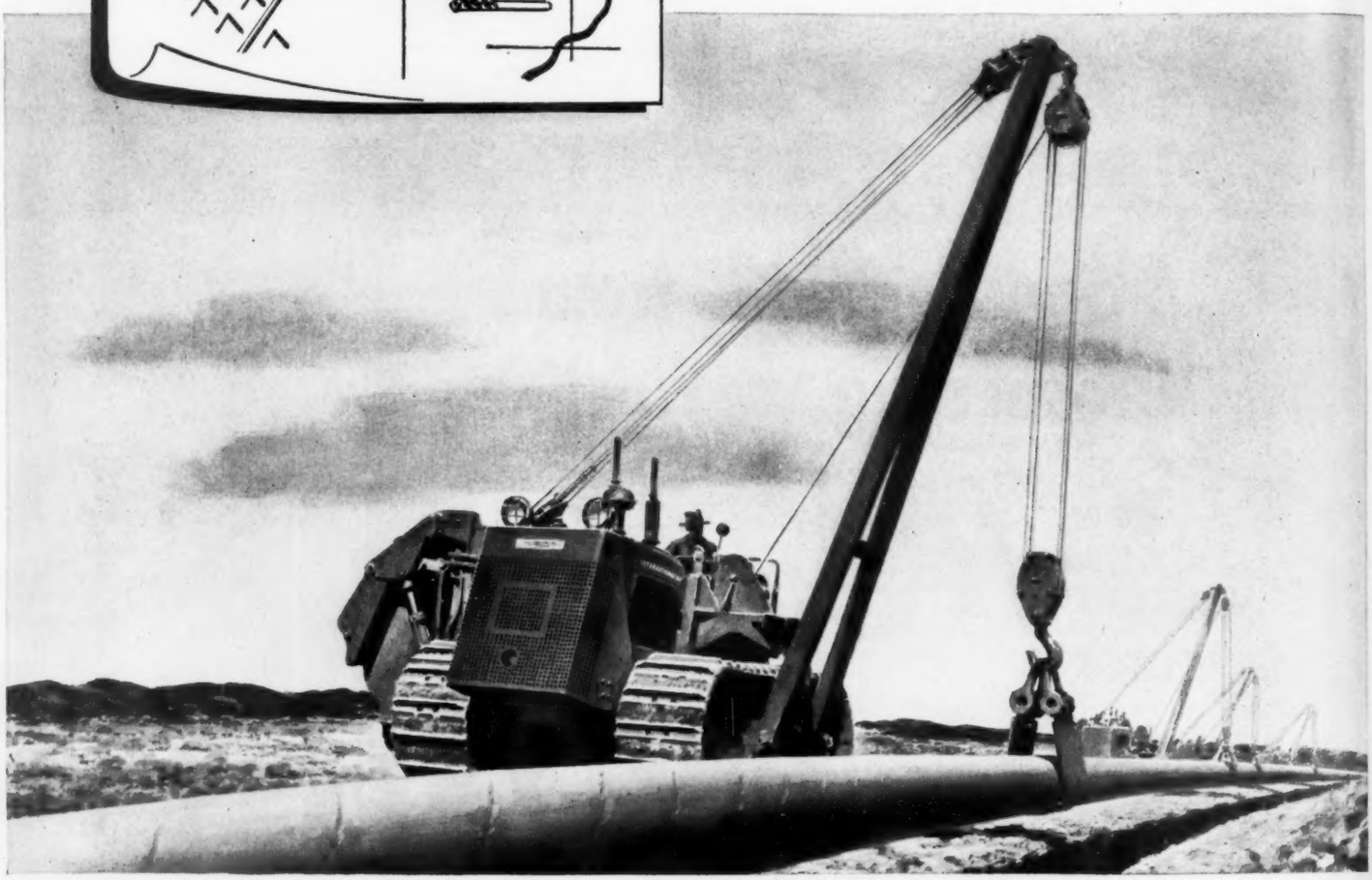
WILLYS-OVERLAND EXPORT CORPORATION

Toledo 1, Ohio, U.S.A.



Putting ideas into action

Pipelaying results are better than ever with an International TD-24 Diesel Tractor and the new Superior-Cardwell Pipeboom. Why? Because you work with the unmatched maneuverability of the world's most powerful tractor . . . capitalize on this performance through flexibility and positive control of a pipeboom with 90,000 pounds lifting capacity.



World's most powerful pipelaying team . . .

International TD-24 Diesel plus Superior-Cardwell PBI-24C Pipeboom! No other equipment can match the outstanding performance record of this combination.

The TD-24 with 148 drawbar horsepower has the ability to handle any crawler assignment. And the new Superior-Cardwell Pipeboom turns that ability into absolute top pipelaying performance. You can lay in 34-inch pipe with ease . . . lift 90,000 pounds at a 4-foot overhang, lift 25,000 pounds and stay 14 feet back from the trench. Extendable counterweights, hydraulically-controlled from the tractor seat, make this tremendous capacity possible without extending tractor treads.

Yes, this equipment cradles the biggest pipe with amazing flexibility of operation, puts the entire pipelaying operation on a faster, more economical basis. See your International Industrial Power Distributor for all the facts. International Harvester Export Company, 180 N. Michigan Avenue, Chicago 1, U.S.A.

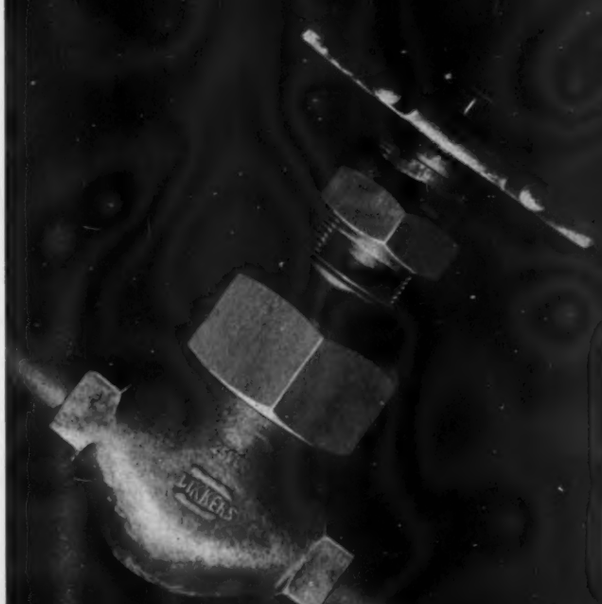
INTERNATIONAL INDUSTRIAL POWER

INTERNATIONAL HARVESTER

CRAWLER TRACTORS
WHEEL TRACTORS
POWER UNITS

ALLIED EQUIPMENT: Bucyrus-Erie Tractor Equipment • Isaacson Landclearing and Earthmoving Equipment • Heil Earthmoving Equipment • Superior-Cardwell Sidebooms and Angle-Fillers • Hughes-Keenan Tractor Cranes • M-R-S Diesel Wheel Tractors and Mississippi Wagons • Hough Payloaders • Trojan Road Maintainers Brookville Locomotives • Ready-Power Engine Generators.

A COMPLETE LINE OF
DROP FORGED STEEL
VALVES
SERIES 600-900-1500
Ask for Oil Catalogue Nr. 480



DIKKERS
HENGELO-HOLLAND
Valve makers since 1879

Facts about the Universe by UNIVERSAL

#3 of a Series

Ptolemy, who lived in Alexandria about 140 A.D., believed the earth was a globe in the center of the universe. Around the earth were seven "heavens" made of crystal, transparent shells. Ptolemy noticed that the heavenly bodies always kept the same relative position to each other, so believed they were fixed in their respective heavenly shells, and revolved with the movement of the heaven.

* * *

Deal with facts when you buy or sell Natural Gasoline, Butane, Propane, Special Solvents and Refined Products. Get the facts from UNIVERSAL first.

UNIVERSAL PETROLEUM COMPANY

Producers and *Marketers of Petroleum Products*

Originators of UNIPLAN

NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA

WORLD PETROLEUM

The Management Publication of the International Petroleum Industry

MONA PALMER
Publisher

E. W. MAYO
Editor

J. C. CHATFIELD
Managing Editor

RICHARD SALA
Art Director

SUBSCRIPTIONS

Annual subscription $5.00 (U.S.) postpaid
Single copies 50 cents

GENERAL OFFICES

2 West 45th Street, New York 19
(Tel. MUrray Hill 2-7333)

BRANCH OFFICES

LONDON
E. H. Doddrell, 342, St. Paul's Corner, Ludgate Hill, London E.C. 4
(Tel. CITY 5318)

LOS ANGELES 14
W. S. Johnson, Western Advertising Manager, 412 West 6th Street
(Tel. Mutual 1391)

NEW YORK 19:
E. L. Townsend, Eastern Advertising Manager, 2 West 45th Street
(Tel. MUrray Hill 2-7333)

TULSA 3
O. F. Cozier, Mid-Continental Advertising Manager, 515 McBirney Bldg.
(Tel. 4-5555)

World Petroleum is published by Mona Palmer, Trustee under the will of Russell Palmer.

CONTENTS FOR NOVEMBER 1950 Vol. 21, No. 12

43 **What Price Efficiency?**

44 **API Exists to Serve Society and the Industry**

46 **API Public Relations Program Achieves Greater Effectiveness**

48 **California's Welcome to Oil Men**

51 **PAD Makes Good Start**

52 **Colombia Considers Its Oil Situation and Outlook**

55 **New Idea in Gas Lift**

56 **Effect of Mexican Trade Agreement Termination on U. S. Oil Trade and World Pricing Policies**

59 **The Petroleum Industry in Relation to National Defense**

60 **Steel is Oil**

62 **First Marine Terminal in New Guinea**

66 **German Oil Industry Making Progress**

72 **ECA Rule Seeks to Establish Middle East as Basing Point**

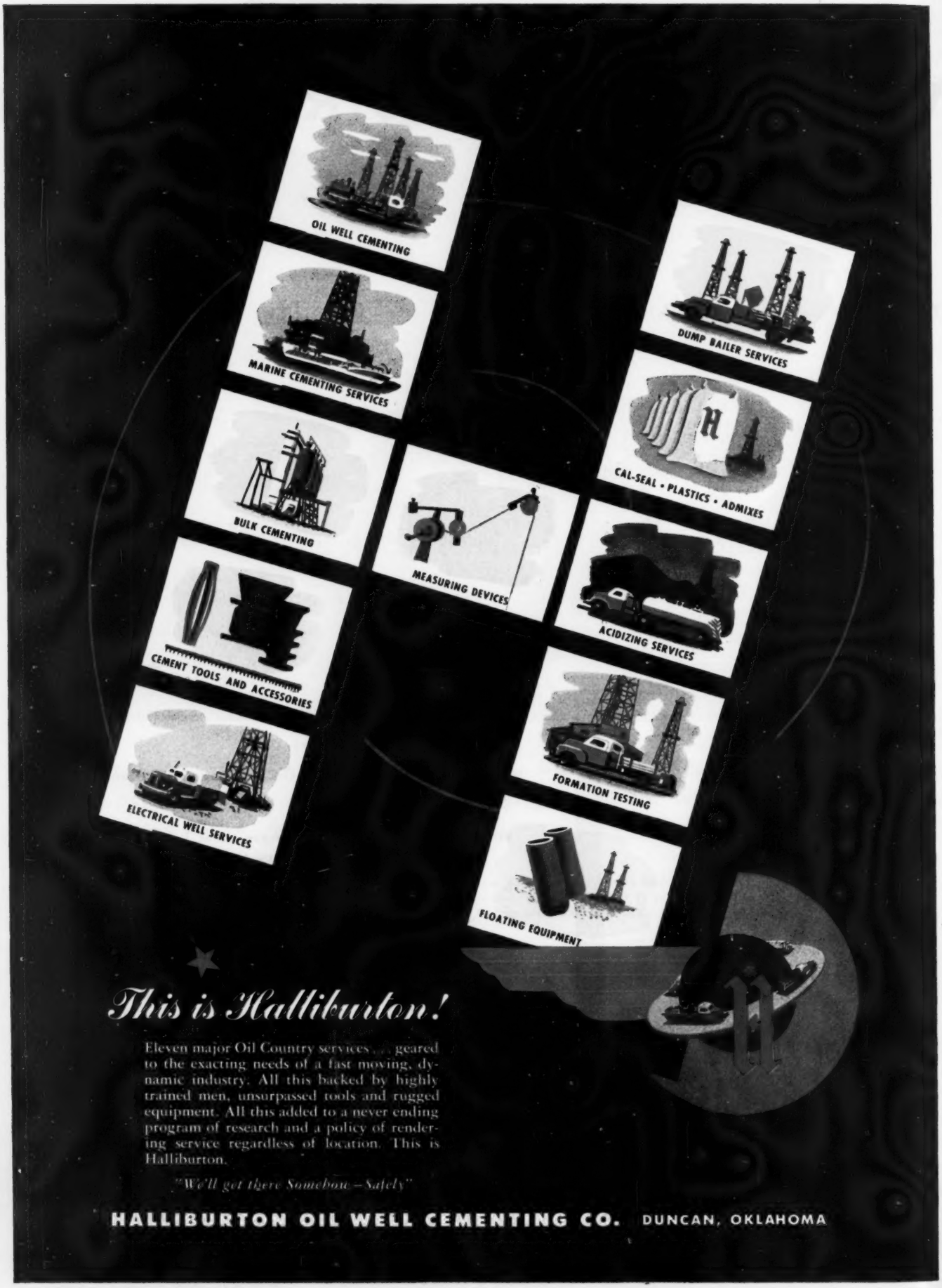
76 **International Notes**

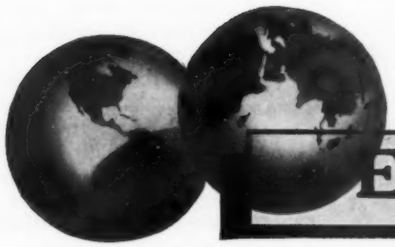
80 **Oil Company Changes**

Member Of National Business Publications, Inc., and Controlled Circulation Audit, Inc.

THIS MONTH'S COVER

The oil industry's great tanker fleet is prepared for deliveries of petroleum products to the far corners of the world for peaceful pursuits or to meet needs of national defense. Color photograph was taken in 1937 on Wake Island by Ed Timmons, chief engineer for marketing operations of Standard Oil Co. of California. Color plates are reproduced through the courtesy of L. W. Peck, editor of "The Standard Oiler."


OIL WELL CEMENTING
MARINE CEMENTING SERVICES
BULK CEMENTING
CEMENT TOOLS AND ACCESSORIES
ELECTRICAL WELL SERVICES
MEASURING DEVICES
DUMP BAILER SERVICES
CAL-SEAL • PLASTICS • ADMIXES
ACIDIZING SERVICES
FORMATION TESTING
FLOATING EQUIPMENT
This is Halliburton!
Eleven major Oil Country services . . . geared to the exacting needs of a fast moving, dynamic industry. All this backed by highly trained men, unsurpassed tools and rugged equipment. All this added to a never ending program of research and a policy of rendering service regardless of location. This is Halliburton.
"We'll get there Somehow—Safely"
HALLIBURTON OIL WELL CEMENTING CO. DUNCAN, OKLAHOMA



Editorial

What Price Efficiency?

IT is practically impossible to find anyone occupying a position of responsibility anywhere in the United States, even in Washington, who does not give at least lip service to belief in free enterprise. Yet it is a paradox of the political system under which we live that at the seat of government itself there is a continuing effort to alter, weaken and ultimately nullify the very forces that have made the nation strong and prosperous, to substitute bureaucratic planning for private initiative, to leave to some federal agency the decision as to what may be produced and to what use it may be put, and to undermine the fundamental principles of competition under the guise of suppressing monopoly.

There is an ingrained belief among professional politicians that attacks upon big corporations are profitable in vote-getting, though the efficacy of such reasoning may be open to question. The oil industry has had possibly more than its share of such assaults, but not all of the attempts to change its structure and management are politically inspired. Some originate with theorists who distrust the people and believe that their affairs would be better managed by a group of economic planners without practical knowledge or experience. Some come from muddled thinkers who seek to introduce their pet reforms by setting up far more dangerous inequities. The ultimate objective may be the same, but the methods of attaining it may be diametrically opposed. In one locality a group of companies are assailed because their products sell at prices that are uniform or nearly so; in another an individual concern is brought to book because its charges are too low and constitute unfair competition.

Most frequent of the charges brought against the oil industry in legal procedures is the assertion that it is monopolistic. When this allegation falls before the test of actual facts, it is modified to the claim that a "tendency to monopoly" is inherent in oil company operations. A favorite method of attack, as attested by bills introduced at every session of Congress, is the proposal for dismemberment of integrated companies on the ground that they are driving out of business the smaller concerns whose operations are limited to a single one of the several branches of industry activity. A doleful picture is painted of a handful of big corporations controlling the great bulk of the nation's oil business and holding the smaller units in dire subjection.

Nobody connected with the oil industry needs to be told that it is among the most highly competitive in the country. It is made up of thousands of units varying in size from the one-truck operator who supplies his village neighbors with fuel oil to the nationwide organization handling oil along every step of its progress from the well to the roadside service station. Each has its place, and all are needed for the efficient operation of the industry. Many of the discoveries of important fields have been made by individual operators whose interest lay only in the finding and production of crude. Much of the transportation of oil and oil products is handled by organizations that have no affiliation with any single company. Thousands of independent jobbers are engaged in the distribution of oil products to wholesale and retail dealers.

On the other hand, there are certain services that can be rendered most effectively by integrated organizations. The construction of refineries requires a heavy investment; their successful operation rests upon a dependable supply of crude and established outlets for their products, which may involve the ownership of production, pipelines and marketing facilities. Large-scale operation and substantial capitalization are essential to the conduct of costly research, which is responsible for the constant improvement in processes and products characteristic of the industry.

THE organization of the oil industry as it stands today is the outgrowth of the demands that have been made upon it and the constant effort to improve its products and its service to the public. At the outbreak of World War II there was a sudden demand for a vast increase in the output of high-test fuel for powering the thousands of airplanes that played so decisive a part in the outcome of the struggle. This requirement the oil industry was able to meet quickly only because of research and invention extending over many years which had shown the way to meet this particular need. The expenditure of many millions in this sort of preparation is not characteristic of monopoly. It is evidence of intelligent and energetic competition.

At that very time the federal government was bringing the celebrated Mother Hubbard suit against the companies primarily responsible for this achievement, an action that was never pressed because of the leading part played by the oil industry in winning the war. Similarly, at the outbreak of hostilities in Korea when the companies on the Pacific Coast, by reason of their location, were called upon for special efforts to meet military demands, the Department of Justice was diverting the energies of their managers and employees to the collection of a huge mass of data to be used in a court proceeding designed to break down their organizations into separate and inefficient particles. The moral is obvious.

A. P. I. Exists to Serve Society And the Industry

By Frank M. Porter
President, The American Petroleum Institute

THESE are critical times. What lies over the horizon—war, peace or the uneasy no-man's land of half-war and half-peace—is something that cannot be foretold with any degree of accuracy. Every move made today and every blueprint that deals with tomorrow must be a considered step. Despite these uncertainties, the American Petroleum Institute is looking ahead with confidence, secure in the knowledge that the services it performs and sponsors will continue to be beneficial to industry, government and our society, regardless of the vagaries of fate and the decisions that are yet to be made in this troubled world of 1950.

Looking ahead has been one of the guiding principles of the American Petroleum Institute since its inception in the eventful days following World War I. Progress and service have been API watchwords; similarly, they have marked the milestones through three decades of history for which political, social and economic change has been unparalleled. Although it has a fine record of achievement, the Institute is not given to looking back upon musty records and fading commendations. It seeks new horizons constantly, and welcomes new opportunities to serve the petroleum industry, the American people and the American Way of initiative and enterprise.

The Institute and all that it represents are examples of the voluntary cooperation and the voluntary service which rank among the strongest pillars of our American system. The fact that many thousands of oil men in all segments and all ranks of the industry will give so freely of their time and effort to promote the well-being of that industry, to expand its services to all our people and to prepare it for mobilization in any national emergency gives substance and vitality to the ideals which made this country the leading nation of the world.

In itself, this voluntary committee work is perhaps one of the most dramatic achievements of the Institute. The work is done, not by the officers or the staff, but by oil men operating through committees on national, state, district and municipal levels. These men devote their time and talents to activities which benefit the industry they represent and the general public as well.

For the moment, it would be academic to discuss future plans of the Institute in view of the troubled world situation. Administratively, the Institute and its committees will continue to carry out their assignments. The problems of war or of peace will receive study, as the pattern of the times dictates.

If all-out mobilization should again become a requisite of the future, the Institute and its facilities, its talents and personnel will be ready for voluntary duty—just as they were in World War II. Every effort will be bent to the task of aiding industry and government alike should any test of strength or of conflicting philosophies materialize.

In this connection, it is interesting to note that the American Petroleum Institute came into being in 1919. The catalyst was World War I. The age-old military traditions of animal power and foot power were revolutionized in a short span of time. Carburetors and mechanization suddenly became decisive factors—and so did oil and oil products.

With the cessation of hostilities in 1918, members of the National Petroleum War Service Committee, which acted as liaison between the oil industry and the government to help provide the "sea of oil" on which Lord Curzon said the Allies floated to victory, had a new concept of industry relations. They felt that the spirit of cooperation which manifested itself in World War I could be continued in peacetime. They felt there was a definite need for an organization, or an association, which would enable the petroleum industry to mobilize its brains and "know how" in the service of its country, to advance the arts and sciences of the industry generally, and meet the multitudinous complexities of the expanding machine age.

The men of the National Petroleum War Service Committee became the API's first board of directors. In swaddling clothes, the infant trade association stepped out to win

Frank M. Porter has had a busy six months since he became president of the American Petroleum Institute. In addition to the job of familiarizing himself with the great API organization, he has traveled extensively to speak before various organizations. Due to his administrative abilities proved during some 34 years as an oil and association executive, the Institute has functioned smoothly in the change-over period.

As a tribute to his public service, his home town, Oklahoma City, recently honored him with a dinner at which he was presented with a scroll which said in part:

"You have never been recreant to the self-imposed duties of your vocation. Having been granted the serenity to accept the things you could not change, the courage to change the things you could, and the wisdom to know the difference, you have utilized all to meet the demands and responsibilities of each recurring day, all to the glory of yourself and to the service of the Oil Industry and to your Country. Congratulations and thanks for tasks well performed."

a place for itself. The early years were lean and difficult, but ultimately the cooperative endeavor gained foothold; then came growing support from all segments of the industry. In the formative days, the functional affairs of the Institute were carried out by a dozen persons in a loft building in midtown New York. Today, more than 10 times that number daily carry out vastly expanded duties and responsibilities. Headquarters are located in Rockefeller Center and division offices have been established in Washington and Dallas. A statistical office also is maintained in Los Angeles.

The 30th annual meeting of the American Petroleum Institute, which is being held in Los Angeles on November 13-14-15-16, is symbolic of the growth and development of the API, and of the many benefits that can be attained by men and industries alike, when they cooperate for the common good.

About 5,000 oil and gas men, active in all phases of the industry will come from all sections of the country, for this four-day meeting. Papers discussing new developments and new techniques, fresh approaches and tested solutions for new and old problems will be presented by experts in many fields. The knowledge that is made available will be passed throughout the petroleum and allied industries. The fruits will be shared by all. The expected attendance of 5,000 is in sharp contrast to the first meeting of the Institute back in 1920, when a comparative handful of 420 men participated and wrote the first full chapter of API history.

A comparison of this type, of course, is striking; but lest wrong impressions be created, it should be noted that this growth did not occur overnight. It required three decades to build the API into what it is today—a national trade association respected at home and abroad for its integrity, its stature and the import of the many services it performs and sponsors.

The structure of the Institute was carefully designed to be truly representative of the industry, so that it would be a forum and nerve center for large integrated companies and small businessmen alike. Significantly, its membership is composed primarily of individuals—drillers, producers, refiners, transporters, pipe liners, technicians, marketing men—the thousands of men who find, process and distribute the nation's petroleum supplies. Membership is open to any resident of the United States, Canada or Mexico working in oil or allied industries and who is at least 21 years of age. Those are the basic requirements.

By its charter, the Institute was established to serve as a medium of cooperation between the industry on one hand and government and the general public on the other; to foster trade in petroleum products; to promote the interests of the petroleum industry, its arts and sciences and to serve as a clearing house for information on the industry and its activities.

Despite certain self-imposed limitations, the range of the Institute's operations is wide and its functions are as varied as the industry itself. They encompass such fields as standardization, design, care and good practice in the use of equipment, fundamental and applied research, accident and fire prevention, waste disposal, testing methods and

specifications, prevention of corrosion, collection and dissemination of statistics, transportation, public relations, education, economics, metallurgy, accounting nomenclature, engineering, taxation and regulation.

From these varied endeavors have flowed new and improved techniques which, over the years, have saved both the industry and the public millions of dollars. Examples of this are the accomplishments of Institute-sponsored activities in the production field. Prior to Institute intervention, a chaotic condition existed because frequently parts and equipment of one manufacturer could not be used interchangeably with those of another. Confusion, aggravation, delay and waste often resulted. Institute committees helped establish common standards; and today, thanks to their untiring efforts, order and efficiency are mileposts in production fields.

Similarly, safety and fire prevention practices and procedures have been recommended by the Institute to minimize danger in industry operations, and in the handling of flammable petroleum products. The rewards of this activity are the industry's safety record, which in 1949 was the best in history.

The Institute's informational and public relations activities help all people reach a better understanding of the oil industry. In addition to answering thousands of inquiries yearly, from students, teachers, business and other institutions, the public relations department publishes numerous books and pamphlets on various aspects of the industry's history and operations. In this category is the work of the Oil Industry Information Committee, which is helping the men of oil tell the story of their industry on community and national levels. This program is only a few years old, yet by the half-way point in 1950 it had more than 3,500 committees and upward of 14,000 oil men in all sections of the country working actively and enthusiastically to engender good will and understanding for petroleum.

Still other Institute activities are the timely statistical reports on industry operations long before this information is available from government sources. The annual reports of the reserves committee have proved their value through the years, too, giving the government, the people and the industry an authoritative estimate of the known reserves of crude, a vital inventory in national defense and planning.

Another Institute activity that aids the general public is the work of the American Petroleum Industries Committee on behalf of fair taxation and enlightened public policies affecting the consumers as well as the dealers in petroleum products.

From this outline of Institute activities, it can easily be seen that the Institute has developed materially as a service organization of benefit to industry, government and the people. There is every reason to believe that this progress will continue, and that the future will see further decades of service by the Institute in advancing the arts and sciences of petroleum and in carrying out the principles of its charter.

As first chairman of the American Petroleum Institute's board of directors, W. Alton Jones has contributed generously from his fund of knowledge of industry policies and practices. He has stimulated interest and promoted active participation of members in the work of the board of directors and its executive committee. His leadership, both in and between meetings, has served to energize committees of the board of directors and thereby to increase the value of the Institute's activities to all members and branches of the industry.

His keen analysis and sound interpretation of Institute policies and problems have been of great assistance to the president in putting into effect the recent changes in organization and activities recommended by special study committees. Mr. Jones, president of Cities Service Company, was elected chairman of the board at the 29th annual meeting of the Institute in Chicago last November.

A.P.I. Public Relations Program Achieves Greater Effectiveness

Shake hands with progress!
You want to know what we're doing to promote your progress. We would like the chance to show you. So why not come in for a visit this week? We'll be happy to show you around.
Oil Progress Week is October 15th–21st
YOUR NAME HERE

A typical Oil Progress Week advertisement prepared by the OIIC for local oil companies.

Scenes from the OIIC educational film "24 Hours of Progress" which tells of the many facets of the oil industry and how it serves the public.

THE 1950 nation-wide public relations program of the petroleum industry, conducted by the Oil Industry Information Committee, was the most effective since its inception in the spring of 1946. The year's activity was highlighted by the eventful and successful Oil Progress Week just concluded.

The OIIC campaign this year reached a greater proportion of the public than ever before with the story of oil's contribution to the American way of life and was supported by a record number of oil men and oil companies.

The latest tabulation of the OIIC's membership showed more than 3,500 committees—state, regional, area and community—active in the program with a total membership in excess of 14,000 men and women. Committee members represent all segments of the industry. The organization of committees in five West Coast states is proceeding under the direction of the Western Oil and Gas Association.

Oil Progress Week, which was observed from October 15 to 21, was the biggest and best public relations effort ever sponsored by oil men. Thousands of oil companies and hundreds of thousands of oil men and women told the story of their industry to their customers, neighbors and friends, emphasizing the theme, "Your Progress and Oil Progress Go Hand in Hand."

During the week, the events marking the occasion included luncheon and dinner meetings featuring prominent speakers, oil plant "open houses," special radio and television programs; special sections and editions of newspapers; community parades, school essay contests, "Oil Men for a Day" events, exhibits and many other special features.

Among the special events were: a pipe line laying contest in Texas; the dedication of a new $3 million oil building in New Orleans; a special dinner meeting for the business and professional women of Atlanta, Ga., sponsored by local oil women; a beauty contest for women oil employees in Denver; and the inauguration of a special oil exhibit for schools in New York City. The latter exhibit is expected to reach thousands over a period of years.

Many of the country's leading oil men, as well as men prominent in other fields, took part in the 1950 observance. They included Frank M. Porter, president of the American Petroleum Institute; Dr. Robert Wilson, chairman of the board of Standard Oil Co. (Indiana); W. Alton Jones, president of Cities Service Co.; J. Howard Marshall, president of Ashland Oil and Refining Co.; J. C. Donnell, II, president of Ohio Oil Co.; L. F. McCollum, president of Continental Oil Co.; Sen. Robert Taft; Representative George Smathers, of Florida; Admiral Chester Nimitz; and Richard Harkness, radio commentator.

The Oil Progress Week message was featured on approximately 3,600 billboards. Hundreds of special oil research exhibits were used during the week; 50,000 window displays were distributed; and several million leaflets were distributed by oil companies in October.

Typical of the Oil Progress Week functions was the luncheon sponsored by the Oil Trades Association of New York which was attended by 1600 community leaders. Principal speaker was W. Alton Jones, chairman of the American Petroleum Institute, and president of Cities Service Co., who called on business men and educators to unite in an effort to give the public a better understanding of the American economic system.

A highlight of the meeting was the presentation to the New York schools of a series of three-dimensional educational exhibits covering all phases of the petroleum industry. The exhibits, to be used as teaching aids in the metropolitan New York high schools, were accepted by Maximilian Moss, president of the New York Board of Education, and Dr. William Jansen, superintendent of New York schools.

In the keynote talk of the meeting, Mr. Jones told the gathering, American industry has paced the progress of the nation to world leadership, but it has failed in one thing. It has not acquainted the public with its own story. As a result there is widespread misunderstanding of how industry operates. Today oil is the lifeblood of industry and transport, he pointed out. In war it is vital to our national defense, while in peace it is a necessity and convenience of everyday living providing the ingredients for 2,600 useful products.

The most important informational piece produced during 1950 was the sound motion picture, "24 Hours of Progress" which depicts the role of oil in the day by day life of America. Made by Louis de Rochemont, it has a commentary by Ralph Bellamy. Everywhere throughout the country it is being shown to oil company personnel, customers, students, civic and social club members, television audiences and other groups. Requests for the film are being received by the OIIC office daily. Use of the earlier OIIC film, "The Last Ten Feet," is continuing also. During the first eight months of this year, industry films were shown to 7½ million persons.

The OIIC pilot program for school is currently getting underway in 26 counties across the nation, and materials for that program are on a production schedule. The Western Oil & Gas Association is participating in the educational program, too. The pilot operation will continue through the 1950-51 school year.

Informational material of great variety was prepared this year by the OIIC for use in the field. A pamphlet produced in January brought to oil men the message, "You've got a story, start telling it now." The expanded OIIC membership and activity this year shows how well the message was received. An important piece was a slide film and booklet entitled "Bill Burns—Fable Killer." Designed for oil industry personnel, the film and booklet refuted many of the popular misconceptions about the industry and showed employees how and why they should scotch fables whenever they are encountered.

A great deal of material was prepared for Oil Progress Week, much of which will find application year round in bringing the story of oil to the public. The various speeches for specialized audiences and the souvenir booklet, "Go Ahead With Oil," are expected to be especially useful for months to come.

George H. Freyermuth, manager of the public relations department of the Standard Oil Co. (N.J.) has been chairman of the Oil Industry Information Committee during the past year.

Rear Admiral Harold B. Miller, U.S.N. (Ret.) is director of the department of information of the American Petroleum Institute, a job he has held since the expanded work of the OIIC first was undertaken.

In all, more than 5¼ million pieces of material were distributed for committee use during the first eight months of the year.

Plans for OIIC activity in 1951 were shaped up at the fall meeting in Atlantic City, and final drafting of the program will be completed when the OIIC meets in Los Angeles in November. A greatly accelerated campaign is envisioned for the coming year, with further growth in the number of active committees and members and an increase in the amount of informative material made available to them and the public.

At Atlantic City, a check survey of public opinion of the oil industry was authorized and it is hoped the results will be available for the November meeting.

The American Petroleum Institute late this year received the Public Relations News' annual achievement award "for distinguished accomplishment in 1949 in leading 5,000 member companies in a public relations campaign to tell the oil industry's story to the whole public at the community and national level."

The 1950 campaign maintained and exceeded that record, and the 1951 campaign is expected to attain a still higher mark in the development of our program to tell the people about our great industry.

California's Welcome to Oil Men

By L. P. Stockman

THE California petroleum industry is rolling out the red carpet and dusting off the welcome mat, preparatory to entertaining members of the American Petroleum Institute in Los Angeles November 13-16, 1950. Western Oil and Gas Association will be host and has left no stone unturned to make the forthcoming meeting an auspicious one. Hospitality will be the keynote, and committees have been hard at work for several months. To assist visitors, information booths will be established at Los Angeles International Airport, the Union Station, and in the Ambassador, Beverly Wilshire and Biltmore hotels.

There will be no golf tournament, but arrangements have been made with several clubs to permit use of facilities and greens. Guest cards will be available at the Biltmore Hotel information booth. Directors of Western Oil and Gas Association, largest official trade association in California, will be host to directors of American Petroleum Institute at a cocktail and dinner meeting at the California Club on Monday evening, Nov. 14, and the Pen Pushers, a California public relations group, will entertain members of the Association of Petroleum Writers at the Ambassador Hotel on the same date. The Twenty-Five Year Club will hold its annual dinner meeting at Los Angeles Country Club on Tuesday, Nov. 15.

Nomad chapters throughout the country will entertain foreign guests at a cocktail supper buffet party at the Rendezvous Room of the Biltmore Hotel on Monday evening, Nov. 13.

The Pipe-Liners Club will hold its annual dinner meeting in the Renaissance Room of the Biltmore Hotel on Monday evening, Nov. 13, and the Transportation Club will hold its annual dinner meeting in the East and West Gold Rooms of Ambassador Hotel the same evening. There will be close to 100 committee sessions in connection with the annual API meeting, the first starting Nov. 9 in advance of the formal opening of the Institute's annual gathering. Of outstanding interest will be presentation of the API Gold Medal for Distinguished Achievement to an undisclosed recipient.

For the first time since 1941, there will be a cocktail hour and banquet at the Hollywood Palladium Ball Room on Nov. 15. It will be a stag affair, as was the case prior to 1941, and a complete sell-out is anticipated. Here is a tip if you are coming to the annual meeting and expect to attend the banquet: Get your tickets early because the Palladium will hold only 2,500 guests. The price will be $15 each, and if you filled out that reservation blank which you received from the Western Oil and Gas Association, you will receive a banquet ticket before you leave for the West Coast. Because of the scarcity of banquet tickets, sales will be restricted, as far as possible, to the actual user, and members of API will receive first consideration. Reservations, accompanied by checks, received too late for mailing will be held at Los Angeles for delivery upon arrival. There will be no vaudeville show in connection with the banquet, but, after the dinner is over, Western Oil and Gas Association will sponsor a professional stage show employing the best talent of stage and screen available and presenting "Oilzapoppin."

Clarence S. Beesemyer, executive vice president of General Petroleum Corp., is general chairman of the committee in charge of arrangements for the annual meeting of the Institute. He has been an outstanding community leader in Los Angeles for many years in addition to his services to the oil industry in state and national activities.

Clarence S. Beesemyer, vice president of General Petroleum Corp. and general chairman of the host committee, has announced there will be a boat trip around the harbor for members on Nov. 14. This will permit members to inspect drilling and production activities in the Wilmington field and to note the result of the subsidence and compaction that has dropped the surface of Terminal Island several feet during the past two years. The effect of a concentric movement simultaneous with the subsidence will be pointed out. This phenomenon affected about 300 wells and has necessitated extensive redrilling work. Various types of remedial work are being employed, depending upon the seriousness of damage and condition of the hole. In wells which were directionally drilled and bottomed beneath the tidelands, it is customary to back up to around 350 feet and redrill the hole. Exceptionally good results are being obtained from this type of work. In straight holes it is possible to drill a 30-inch bell hole to approximately 1,600 feet and recover the lower part of the hole. In some cases replacement wells are being drilled. A luncheon will be served and the harbor trip will require four to five hours.

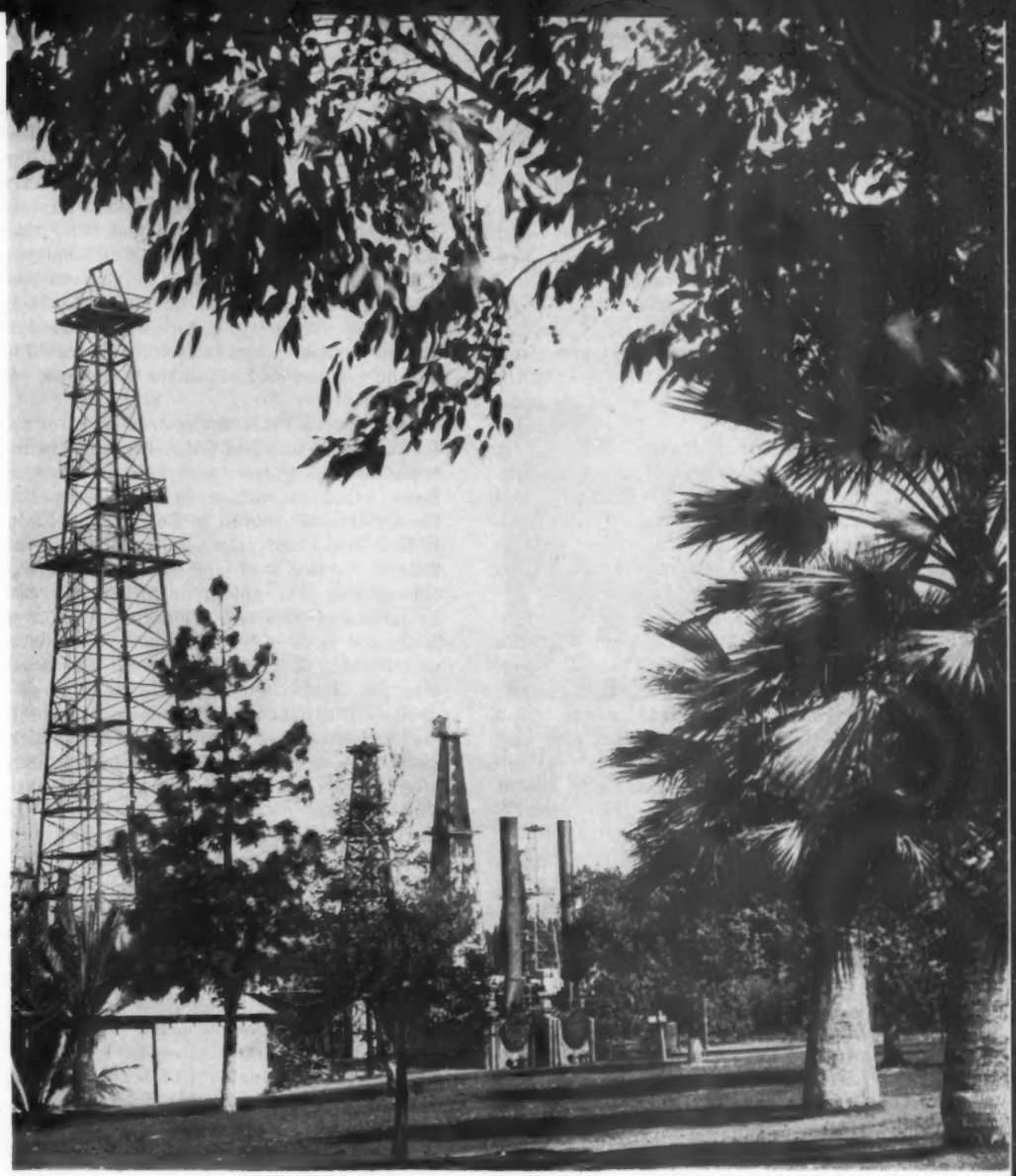
Although not regularly scheduled, it will be possible for a limited number of members to visit the Cuyama Valley region which is California's hot spot at the present time. Because of its distance from Los Angeles, it will be necessary to fly to the area where Richfield Oil Corp. has a landing strip. This

will also permit guests to see development work at Morales, Russell Ranch and South Cuyama as well as the entire area, something that cannot be done in an automobile due to the hilly and rough terrain. By air the trip will not consume much over 40 minutes actual flying time each way.

In addition to Cuyama Valley, guests will also be able to see portions of the Midway-Sunset field and the rugged mountains along the south side of Cuyama Valley where Standard Oil Co. has spent approximately $65,000 for construction of about eight miles of road to reach a wildcat location on Pine Mountain. Geological reconnaissance was done in this region by geologists who traveled by pack train and encountered almost insurmountable obstacles. Much of this area is practically virgin territory characterized by rough topography quite similar with the Caliente Range along the northern part of Cuyama Valley. Standard's wildcat has an elevation of 6,806 feet, and the company has found it necessary to install heating facilities in operating quarters because at this elevation snow and cold weather can be expected later in the year. This is an unusual situation for California prospectors.

The thirtieth annual meeting of the Institute to be held in Los Angeles is especially apropos because of the fact that California recently passed the ninetieth anniversary of the discovery of crude oil as such, and the seventy-fifth anniversary of the completion of the first commercial oil well in the state. The forthcoming meeting will be the first on the West Coast since 1941 and the first in Los Angeles in 15 years. Previous West Coast meetings were held in San Francisco nine years ago and in Los Angeles in 1935. Holding these meetings in various oil-producing states is to be commended because it permits many API members to attend meetings who would otherwise not be in attendance. The chief drawback to annual meetings in various oil-producing regions is the cost involved. Members of the Western Oil and Gas Association underwrote the cost of the 1950 meeting which will be in excess of $100,000.

California crude oil production comes from three geologic provinces, designated as the San Joaquin Valley region, Coastal region and Los Angeles basin. The San Joaquin Valley region, otherwise the Great Central Valley, is located between the Sierra Nevada and Coast Range mountains and extends northward from the Tehachapi Mountains in southern Kern County almost to the Oregon border. This Great Central Valley, which is approximately 75 miles wide at its widest spot and about 400 miles long, comprises about 16,000 square miles, although oil field concentration is limited to a much smaller area. Topographically the valley is characterized by its basin or valley form and is comparatively free of any interruption by hills or mountains.



Oil lease—California style.

The Great Central Valley is made up of the drainage basins of the Sacramento and San Joaquin rivers which unite as they enter San Francisco Bay. The northern section of the Great Central Valley is generally known as the Sacramento Valley and contains numerous commercial gas fields, one of which, Rio Vista, is the largest and most productive dry gas field in the state. It has for several years furnished a substantial part of the gas demand for San Francisco Bay regions. A new California-Texas natural gas line to San Francisco is nearing completion, and Pacific Gas and Electric Co. expects to begin taking maximum deliveries late this winter. Only small oil production has been obtained in

Long Beach harbor with derricks of Signal Hill field on the horizon. Fairchild Aerial Survey photo.

the Sacramento Valley to date. The southern section of the Great Central Valley, designated as San Joaquin Valley, is the state's major oil province and contains major accumulations of oil and gas.

The Coastal province consists of the North and South Santa Clara Valley districts, Ventura district, Santa Barbara district, Salinas Valley and the Santa Maria district. All of these regions are located west of the San Andreas rift and at various distances from tidewater. Cuyama Valley is also west of the San Andreas fault, but, because of its proximity to Midway-Sunset field, is generally classified with the San Joaquin Valley group of fields. The San Andreas fault is a prominent topographic feature of California and can be measured for a distance of 600 miles in a southeasterly direction from a point north of San Francisco to the Salton Sea southeast of Los Angeles.

Counties included in the Coastal region are portions of Los Angeles, Monterey, Santa Barbara, San Luis Obispo and Ventura. Santa Barbara and Ventura counties are the only portions of the state where main topography lines have a consistent east-west direction. The Coastal district yields oil and gas and contains several major fields, one of which, Ventura Avenue, is a truly remarkable and prolific field. Wells below 14,000 feet are still in Pliocene rocks, and it is estimated there should be at least 20,000 feet of Pliocene and another 30,000 feet of Miocene sediments. It is perhaps the deepest sedimentary basin in the world, and there may be potentially productive formations beyond what is now regarded as the maximum depth attainable. No operator has yet drilled entirely through the Pliocene. The present deepest pool is the D-7 pool.

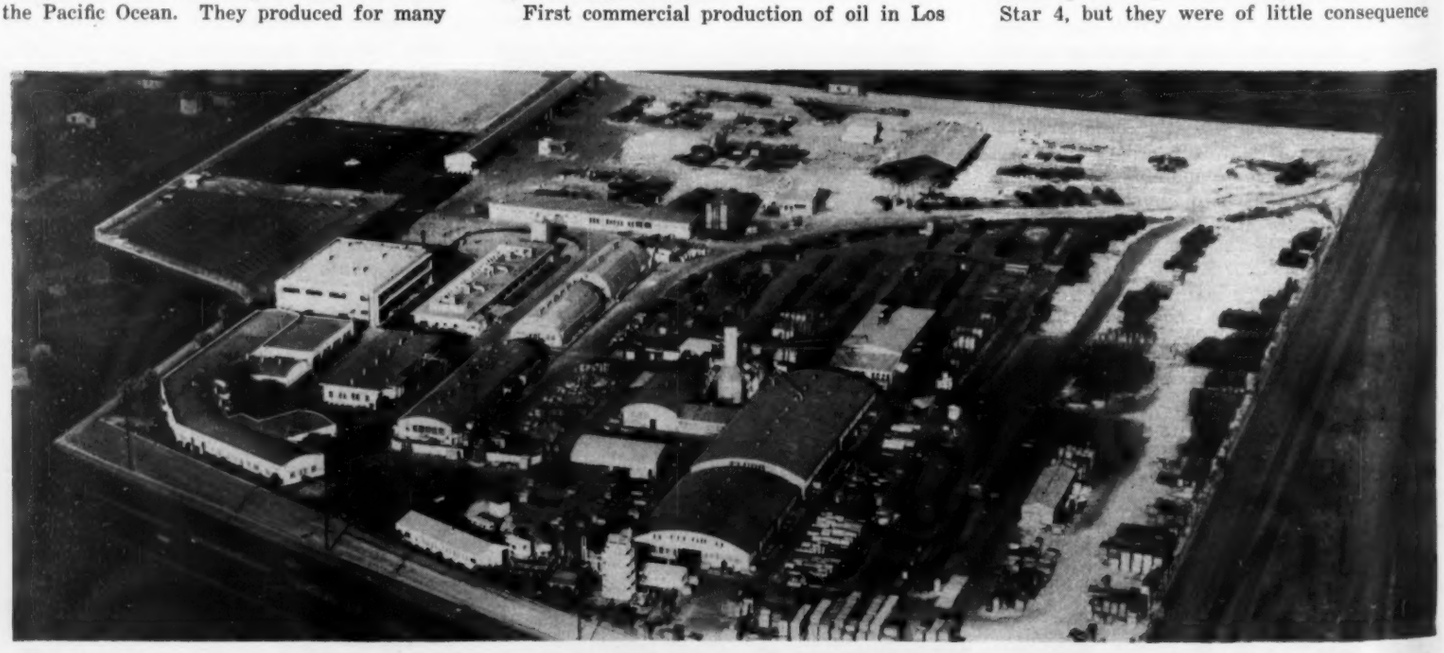
The Coastal district contains several tideland accumulations, and when, or if, the continental shelf is opened to the drill, additional fields may be found out in the open ocean. The old wells at Summerland were the first tideland wells to be drilled in open water. These early wells, which date back to about 1894, were drilled from piers built out into the Pacific Ocean. They produced for many years but time and heavy surf gradually took their toll. Years later similar operations were carried out at Elwood in Santa Barbara County and at Rincon in Ventura County. The Summerland wells were drilled as straight holes, but at Elwood, Rincon and other tideland areas directional drilling was employed. The Goleta gas field in this region was purchased several years ago by Pacific Lighting Corp. and is being used for gas storage during the summer months and for withdrawal of gas during the cold season to meet peak gas demand.

Los Angeles basin is the area south of the Santa Monica and San Gabriel mountains and includes Los Angeles and Orange counties. Some small production in San Bernardino County is also included in Los Angeles basin. It is a broad and relatively flat plain, being flanked on the west and south by the Pacific and on the north, northeast and east by ranges of hills and mountains. The area is drained by the Los Angeles and San Gabriel rivers which flow nearly due south and drain into San Pedro and Alamitos bays respectively. The outstanding geologic feature is the Newport-Beverly fault zone along which, en echelon have been found several highly prolific fields. A second major line of anticlinal folding is along the east side of the basin and is known as the Coyote Hills uplift. It contains several prolific fields.

Los Angeles basin, comprising about 1,000 square miles, has produced more oil than San Joaquin Valley or the Coastal district to date but ranks second to San Joaquin Valley in estimated crude oil reserves. At the present rate of production, cumulative production of San Joaquin Valley should surpass Los Angeles basin within another few years. Because of the large amount of heavy crude oil produced and also because, in most cases, leases contain large blocks of acreage, San Joaquin Valley has several times experienced an interruption in production during periods of overproduction elsewhere in the state. As a consequence cumulative production of San Joaquin Valley is below the volume produced by Los Angeles basin.

First commercial production of oil in Los Angeles basin was obtained in about 1880 from Miocene rocks in Puente Hills, and this was followed by additional discoveries in the Los Angeles City field in 1892, Whittier in 1893, Brea Olinda in 1897 and Salt Lake in 1902. The first field to be found in which anticlinal folding was the major factor controlling oil accumulation was West Coyote in 1908. An outstanding characteristic of Los Angeles basin fields is a multiplicity of productive pools, some fields containing as many as eight oil and gas pools in rocks of Pliocene and Miocene age. Early history of the California petroleum industry is quite obscure, and consequently it is not possible definitely to pinpoint the original discovery and ascertain which was the first commercial producing well. It is logical to assume that the presence of oil was known to California Indians who roamed the area as well as early Spanish and Mexican settlers and missionaries. Certainly they could not miss the La Brea tar pits in the Wilshire district of Los Angeles from which have been extracted the fossil and skeleton remains of early geologic specimens dating back millions of years. This indicates the presence of the pit, and recovery of domestic animals indicates it was known.

Recent research has indicated that a consignment of crude oil left California by water for the East Coast before Colonel Drake's discovery, but this was secured from active oil seeps. This oil did not reach its destination due to heavy weather and partial beaching of the transport vessel. First reference to a drilled hole dates back to about 1860-61, and this was made undoubtedly by a spring pole or other crude equipment. Previous to that time oil development was limited to hand-dug holes and pits. For many years prospectors spent more money than the value of oil produced. The first sustained commercial producing well may have been Star 4 of California Star Oil Works Co. in Pico Canyon about 1876. This company was the predecessor of Standard of California and was headed by D. G. Scofield. There were other producing wells completed ahead of Star 4, but they were of little consequence



Typical of the Los Angeles oil equipment suppliers who will hold open house for Institute visitors is the Fluor Corp. whose plant is pictured here. Fluor is celebrating its 60th anniversary of service to the industry.

PAD Makes Good Start

By Joseph B. Huttlinger

Washington

THE currently developing pattern for government relations with the oil industry during the months of mobilization ahead is one that appears to please the industry. Basically the pattern, the result of high-level discussions between government and industry leaders, emerges as something akin to the old Petroleum Administration for War. This time, the name is Petroleum Administration for Defense (PAD).

Operating directly under Interior Secretary Oscar L. Chapman with no non-oil agencies carrying veto powers, and staffed in at the top spots with oil industry men, PAD appears to be just what the National Petroleum Council had fought for.

In an early test of its ability, PAD came through with flying colors. On Oct. 4, it sent a telegram to 30-odd petroleum refiners asking them to supply additional aviation gasoline for the military through "emergency" measures. The response was so good, that observers think voluntary action by the oil industry will be relied upon to meet similar military and emergency needs, at least for the present. The telegram from an oilman-staffed PAD did what an identical, earlier telegram from Secretary Chapman failed to do.

The PAD is the outgrowth of the government's overall mobilization effort and the Defense Production Act which establishes virtual wartime powers in the hands of the government. In it the Interior Department is given control of petroleum and natural gas, gas and oil pipelines.

Many planners in Interior urged creation of an overall energy agency, including coal, electric power, metals and minerals and oil and gas, but oil men objected strenuously. The planners prevailed upon Secretary Chapman, who even announced creation of such agency. Next day, he recanted, went before the National Petroleum Council's "emergency" session in Washington, and outlined the future for oil.

His words on Sept. 28 are important:

"First, we have agreed to seek the advice of this Council upon the kind of organization that is required in government that most efficiently and effectively will produce the governmental assistance needed by industry to meet the tasks ahead. Second, we have agreed that any organization established should be set up on vertical lines as far as oil and gas are concerned, and that such administration should be headed by a deputy administrator, who will report directly to me as administrator."

The secretary said experienced staff men can "only come" from industry, who would be expected to furnish them. Interior Department personnel would help out. He added:

"Knowing as I do, the inherent advantages of competitive enterprise to our general welfare, I want all members of this Council to know that it shall be my purpose, as petroleum administrator under the Defense Production Act, to so use the powers entrusted to me, as far as is humanly possible, to leave at the end of this emergency the same competitive relationships among the units of the oil and gas industry as exist today."

The same day a NPC committee reported back in detail to Secretary Chapman what kind of agency it preferred and on Oct. 3, Secretary Chapman gave the industry what it wanted.

Although Secretary Chapman is administrator, a deputy administrator is to be the working director of PAD. When Ralph K. Davies, once director of the old PAW, refused the active job, Secretary Chapman, and the NPC went after Bruce K. Brown, chairman of the Military Petroleum Advisory Board, and president of Pan-Am Southern Corp., New Orleans. A delay came about until it could be determined whether heads of the PAD could continue receiving salaries from their companies.

Named consultants or staff members of the new agency were Maj. J. R. Parten, president, Woodley Petroleum Co., Houston; J. Howard Marshall, president, Ashland Oil and Refining Co., Ashland, Ky.; A. P. Frame, vice-president, Cities Service Oil Co.; Thomas L. Apjohn and Donald P. Heath, both Socony Vacuum Oil Co.; Bruce W. Dunbar, Shell Oil Co., and Walter C. Huffman, Sun Oil Co.

The task of PAD is to claim steel and other scarce materials for the petroleum and gas industry; to determine requirements of other industries for petroleum and gas and to allocate the supply at the wholesale level; to establish "programs and policies" for oil and gas; to cooperate with other government agencies about materials, manpower, procurement, financing, loans and other matters.

A list of top jobs in the PAD indicates its duties. They are general counsel, administrative officer, finance counsellor, manpower counsellor, materials director, director of public information, program director, directors of operating divisions as appropriate, and assistant deputy administrators.

For the remainder of this year, the task appeared to be to stimulate the production of aviation gasoline, of which the military is seeking 33 million barrels a year at this time. To meet this, production stood in mid-October at 135,000 barrels daily, but the PAD has a goal of 160,000 barrels daily by the end of the year. Next year, the goal is higher, so high, says Major Parten, that oil companies will have to spend up to $100 million on plant expansions to meet it. In doing this, they have nothing but a "my assurance" memorandum from Secretary Chapman, that costs will be reimbursed by government construction aid, or higher prices.

If PAD began on a small scale, it had big ideas. It started with a handful of persons from Interior's Oil and Gas Division, headed by Hugh A. Stewart of Denver, formerly with The Texas Co. and for a time acting deputy head of PAD. But the agency shortly recommended to Secretary Chapman that it expand to 300 persons by the year's end. For paying them, it suggested that Secretary Chapman ask Congress for $512,000 for a six-month period. After next June PAD may expand further. The proposed staff of 300 compares with a staff of 1500 in PAW during the peak of the last war.

Bruce K. Brown, president of Pan-Am Southern Corp., has been mentioned as the active head of PAD during the period of rearmament. As deputy administrator of the PAW during World War II he was a leader in the development of 100-octane plants for aviation gasoline production.

Major J. R. Parten, president of Woodley Petroleum Co., Houston, Texas, who has been named special consultant on industrial mobilization to Oscar L. Chapman. Major Parten was director of transportation for PAW during World War II.

Heart of the oil problem in the coming months, may be the steel supply. Aware of this the National Petroleum Council spent two months estimating future needs of steel for the oil and gas industry of American companies at home and abroad. Their finding, 11,650,000 tons for 1951. About 10 percent of total U. S. steel output, the figure is higher than the 9,923,000 tons used this year. This quantity of steel would drill a record of 43,400 U. S. wells in 1951, expand domestic refining capacity by 200,000 barrels daily, drill 1644 new wells in the Western Hemisphere and 141 in the Eastern, hike Eastern Hemisphere refining capacity by 110,000 for 1950 and 1951, take care of the 450-mile Edmonton-Regina pipeline to carry 100,000 barrels daily to Superior, Wisc. Most of this expansion is greater than this year's, so the Commerce Department is expected to try to whittle down the figures. An article elsewhere in this issue by Minor Jameson, Jr., secretary of the NPC committee, discusses producing division steel needs.

A thousand small problems and a score of major ones lie ahead for the new petroleum agency. It must seek antitrust clearance from the Justice Department to enable the industry to cooperate in meeting shortages. This is always a difficult task. It probably will have to fight an anticipated new Treasury Department drive against the depletion allowance next year. Price controls, in the hands of the new stabilization agency, would take time. Draft deferments, military procurements, priorities, allocations, the adequacy of transportation facilities, the need for more oil and gas lines, whether to export steel for refineries and pipelines and stockpiling all will be on the agenda.

Oil men are hoping that the adage is true that well begun is half done. At present, they believe they have what they want, have kept government control to a minimum. and have confidence they can do whatever job is needed.

E. Ospina-Racines

Columbia Considers Its Oil Situation and Outlook

By E. Ospina-Racines

DURING July 1950 Colombia attained a record oil production of 100,314 barrels daily. This record may be compared with the annual average of 67,763 barrels daily for 1948 and 83,321 for 1949. The July record represents a 20 percent increase over the 1949 average and close to a 50 percent gain over 1948. Data are given in Table I.

Although the above level of oil production may be maintained for a few years, it is unlikely that it will be surpassed in view of the drop in wildcatting throughout the country. Last year 17 wildcats were completed by six different operators, with one strike by The Texas Company in the upper Magdalena Valley, some 550 miles from tidewater. This was Tetuan I which was brought in for 744 barrels daily of 23° API oil. Currently Texas is prospecting three properties, Velasquez, Tetuan and Salamanca, on the Caribbean continental shelf. Shell is wildcatting in the Cimitarra block, just north of and adjacent to the Yondo producing property. Colpet is making a deep test in the Barco in an effort to reach the Cretaceous pay also found in the two producing fields of Petrolea and Tibu. It has recently been tested, TD 8305 feet for some 650 barrels daily of 54° API oil. Not more than eight wildcats will be completed in Colombia during the current year. In short, Colombia is experiencing a maximum oil output with a minimum of exploration activity.

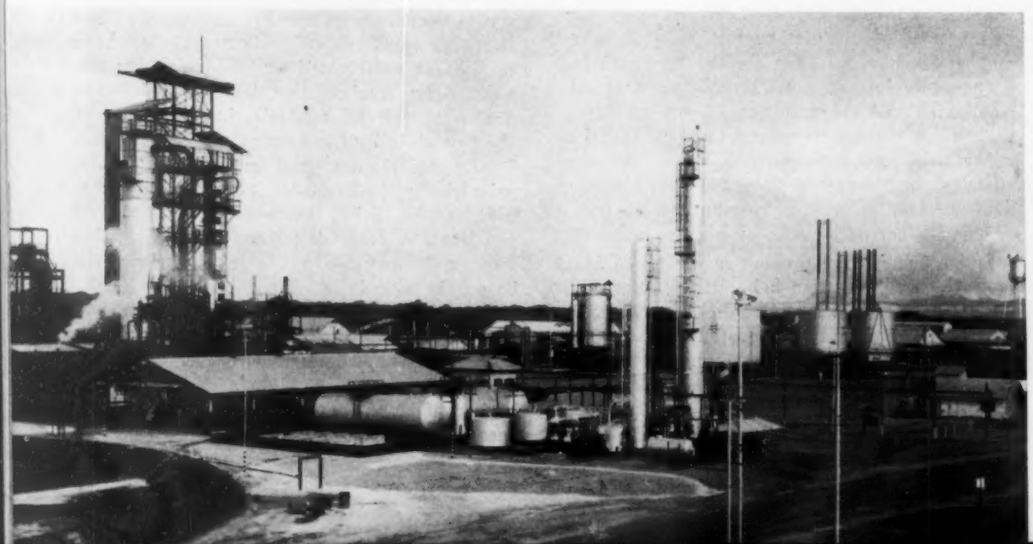
The July record of oil output was contributed by six properties and five operators, as indicated in Table I. The increase in production between 1949 and July 1950 may be attributed principally to Shell's Yondo property wherein the Casabe is the only producing field. Its output increased from 17,060 to 31,827 barrels daily, which is practically the increase registered for Colombia. Yield from the Dificil property is dropping. During January this field reached its maximum daily output of 5,012 barrels of 42.3° API oil. As may be seen from Table II, the Dificil field was discovered in 1943 and placed on commercial production August 1948. Twenty-nine wells were completed in this field, and no further drilling is taking place.

From the data of Table II, the De Mares property accounts for 37.5 percent of the current oil output of the country. This property will revert to the Colombian government with all the machinery, equipment and the Barranca 25,000 barrel topping plant on Aug. 25, 1951, after a 30-year exploitation period. Pipeline shipments to seaboard from De Mares started in July 1926 over the 335-mile Andian common carrier. As of Dec. 31, 1949, a total of 390 million barrels of crude and 15 million barrels of petroleum condensate had been produced. The current production amounts to about 12 million barrels of crude and condensate annually. Lately the oil output has been sustained and somewhat increased following gamma ray surveys of oil wells by Schlumberger and gun perforation of untapped oil sands. In some instances wells which had been previously yielding some 80 barrels per day have resulted in 1,000-barrel producers. This accounts for the daily increase of 33,483 barrels for 1949 compared to the July 1950 output of 35,068 as revealed in Table I.

De Mares' known oil reserves are placed at some 125 million barrels. Whatever the oil reserves may be, oil production is limited by the maximum throughput capacity of the Andian pipeline, which is placed at some 62,000 barrels daily, half of which is taken by Shell's Casabe oil. Last year Andian carried out a major throughput capacity enlargement program, adding eight new pump stations at a cost of some $3 million. This raised the pipeline movement from 42,000 to the present maximum of 62,000 barrels daily for the heavy oil of 20.5° and 22° API. De Mares has four producing fields.

Of the 405 million barrels of crude and condensate produced to Dec. 31, 1949, a total of 329,234,340 barrels of oil were exported and brought $391,741,310 or a weighted average price during the 23-year period from July 1926 of $1.19 per barrel fob Mamonal, export terminal of the Andian pipeline. Last year, of the 6.87 million barrels of De Mares crude exported, some 4.41 million barrels represent topped crude from the Barranca refinery, for which there was no domestic sales outlet as fuel oil.

The reversion of De Mares next year will be the first experience for the Colombian government in obtaining not only a going oil producing concession, but also an oil refinery which supplies practically all the 5.5 million barrels of oil products or 78.5 percent of the seven million barrels of oil consumed in Colombia annually, as revealed in Table III. Last year nine million barrels of crude were topped in the Barranca plant, which yielded about 13 percent of gasoline stock. The Barranca refinery produced 59 percent of the gasoline requirements of the country, as against 41 percent imported from Talara, Peru and Aruba. The 700-barrel topping plant in the Barco concession supplied only 131,500 barrels of gasoline and diesel oil of the total output of oil products in 1949. The Barranca refinery, which also produces phenol solvent, lubricating oils and greases and has a drum and tin packing plant, is appraised at $6.5 million. Details of its oil products supply role appear in Tables III and IV.



Tropical Oil Co. topping plant at Barranca which will revert to the Colombian Government on Aug. 25, 1951. Foster Wheeler Corp. has recommended modernization and installation of a cracking plant.

Dr. Manuel Carvajal

STATEMENT BY DR. MANUEL CARVAJAL, MINISTER OF MINES AND PETROLEUM

Colombia is interested in attracting foreign capital to promote industries which are essential to its development, especially the oil industry.

Definite steps were taken this year to make the terms of the oil concession contracts more attractive, and the government is now studying the status of the oil industry with the aim of expediting the procedure and requirements in force for the contracting of oil concessions in the country.

The increased consumption of oil products is out of proportion to the crude oil output. It is, therefore, necessary to promote oil exploration, and with this as its object, the government will do all within its power to offer conditions which will be attractive to foreign capital which wants to come into the country to work in the search for new oil fields.

Reversion as a principle in oil concessions appears not only in Colombia but also in the oil contracts of Venezuela and Middle East oil countries. Reversion of oil-producing properties in Venezuela was postponed by the oil law of 1943 and through the conversion of former contracts under the new oil law. Reversion in Middle East will be operating toward the end of the century, in view of the terms ranging from 66 to 75 years for most of the oil concessions granted since 1925 in that great oil area.

Treatment of De Mares after reversion has been receiving much attention from the press, the citizenry and the government, particularly from the Ministry of Mines and Petroleum, the National Petroleum Council, the Ministry's consulting body and the group "ANDI," representing the National Association of Manufacturers. It has been proposed and the government has agreed in principle that a semi-official enterprise should be organized with a majority of the board of directors representing private interests, principally with the aim of eliminating political influences.

For more than a year past government, private and ANDI representatives have been discussing the terms under which the proposed semi-official oil enterprise should be organized, but the by-laws of the new organization have not been drawn up as yet.

The government also has sounded out the five major operating companies in Colombia as to the interest they might have in becoming shareholders. Only Tropical replied that it was interested in principle; the other four companies replied that they definitely were not interested. Last year the Minister of Petroleum announced that the management of Tropical had advised its decision of not participating in the proposed semi-official oil enterprise. The only private group which is interested is the ANDI, representing exclusively Colombian capital, for the most part manufacturing enterprises located in Antioquia, Colombia's foremost industrial state and a thriving region. Engineer Cipriano Restrepo, a graduate of the University of California, formerly head of the Colombian Tobacco Co. and a prominent member of the ANDI, was appointed to act as its representative in negotiations with the government.

Colombia's main oil problems today may be summarized thus: (1) creation of inducements for the operators to step up exploration and wildcatting; (2) construction of refining capacity to eliminate motor fuel imports insofar as possible and obtain savings in dollar exchange; (3) construction of products pipelines to eliminate the drum, tankcar and tanktruck difficulties which the growth of consumption, weather conditions, poor roads and railroads have created; (4) the reversion of De Mares with its attendant financial and technical problems of production, refining and sale of excess crude in the world market, for dollars; (5) financing the De Mares and products pipeline construction programs with dollar credits for the most part.

The Colombian government, aware of some of these problems and their magnitude, has taken the following steps toward their solution:

As an inducement to operating companies to promote exploration, the oil law was amended by a decree-law early in 1950. Some of the amendments, particularly as they deal with a greater depletion deduction and amortization of investments made through affiliated enterprises, as well as the authority to the Ministry to waive the drilling obligation in lieu of geological and geophysical exploration, are favorably regarded. However, there remain a number of features in the oil law, as well as the tax laws, which must be amended if Colombia is to compete with other world prospective oil areas. During 1949 there were ten operators active in Colombia; now only six remain, of which four are active.

Last year the government contracted the expert services of Foster Wheeler Corporation to make a survey and recommendations for the oil industry and particularly for the future of the De Mares property. Foster Wheeler has recommended the revamping and modernization of the Barranca topping plant, calling for cracking and polymerization units, and an investment of some nine million dollars. At the terminal of the 335-mile Andian pipeline on the Caribbean coast, a refinery should be built to process principally high gravity crude and to supply the Atlantic and Pacific coastal markets of Colombia to offset oil products imports. The investment for a complete refinery would be around $24.5 million, but a topping plant representing only $13.5 million investment is suggested as an alternative. This would be a 12,000-barrel plant with a 6,500-barrel cracking installation.

In addition to the Foster Wheeler survey, the International Bank for Development and Reconstruction, of Washington, U.S.A., organized a mission of 14 experts, headed by Dr. Lauchlin Currie, for the purpose of making an overall survey of the Colombian economy and to recommend a program to elevate living standards. The mission arrived in Colombia in July 1949 and ended its work the following November. The report is comprehensive and covers an appraisal and recommendations dealing with manufacture, agri-

Dr. Laureano Gomez, who became President of Colombia on August 7, 1950.

Playground and school on the De Mares concession. Photo courtesy Tropical Oil Co.

TABLE I

Crude Output by Fields
Average Barrels Per Day

Period	De Mares	Barco	Yondó	Cantagallo	Dificil	Velasquez	Total Colombia
July 1950	35,068	25,682	31,827	1,342	2,857	979	100,314
Year 1949	33,483	25,920	17,060	924	4,174	615	83,321
Year 1948	24,753	21,797	15,489	1,067	2,972	—	67,653

TABLE II

Producing Oil Fields of Colombia

Operator		Producing Property	Percentage July 1950	Year of Oil Discovery	Pipeline Shipments Started
U. S.	Colombia				
SONJ	Tropical	De Mares	37.5	1916	1926
Socony-Texas	Colpet	Barco	25.7	1933	1939
Shell	Condor	Yondó	31.8	1941	1945
Socony	Valmag	Cantagallo	1.3	1941	1947
Shell	Condor	Dificil	2.8	1943	1948
Texas	Texas	Velasquez	0.9	1946	1949

TABLE III

Oil Consumption and Imports, 1949

	U.S. Millions of Barrels	Percentage of total
Crude output, 1949	29.7	100.0
Crude exported, 1949	24.2	81.5
Domestic consumption	5.5	78.5
Imported consumption	1.5	21.5
Total consumption	7.0	100.0

TABLE IV

Aviation and Motor Fuel Consumption and Imports, 1949

	U. S. Barrels at 60°F		
	Domestic	Imported	Total
Aviation fuel	103,852	216,934	320,786
Motor fuel	1,808,044	1,104,524	2,912,568
Totals	1,911,896	1,321,458	3,233,354
Percentage	59	41	100

Note: De Mares' Barranca refinery produced all aviation gasoline and 1,727,626 barrels of motor fuel. Balance of 80,419 barrels motor fuel obtained in Barco topping plant. Barranca refinery accounts for 98.5 percent of total aviation and motor fuel production of the country.

culture, transportation, petroleum, mining, construction and public utilities. The entire program calls for an investment of $2.5 billion, of which Dr. Currie believes two-thirds could be financed by private investors and one-third by the government. Dollar credits abroad for imports for the program are placed at some $853,500,000; the balance would be in pesos. A summary of the recommendations of the Currie mission applying to the oil industry, as published in the preliminary report, follows:

(1) "Colombia's oil reserves are very limited. They will not last at the current rate of production more than 10 years. Barco reserves are one-third of the total." Currie recommends "as of extreme importance, the promotion of intensive exploratory activity by the oil companies. The government, therefore, must establish without delay an oil policy which will stimulate oil exploration." This was attempted by the decree-law early in 1950, but in addition to being too late, its provisions are inadequate to offer real inducements to oil capital.

(The new administration which took office on August 7 last, headed by Dr. Laureano Gomez, is keenly interested in establishing effective inducements, and definite measures toward this goal may be expected in the near future.)

(2) The report recommends that Barco crude (high gravity 33° and 46°) should be refined domestically. The loss of oil exports of Barco crude should be made up by stepping up De Mares and Casabe (low gravity 21° and 24.5°) oil output. Ownership of the oil from these concessions is completely overlooked.

(3) The De Mares Barranca refinery topping some 25,000 barrels daily should be enlarged by 17,000 barrels, and modern cracking units should be installed. Barranca's strategic location in relation to crude oil and the delivery of oil products should be utilized to its maximum. A combination topping and cracking unit is recommended at a cost of not more than $10 million. Experienced private management is recommended for the enlarged refinery.

A loop of the Andian pipeline could be reversed to carry Barco high gravity crude to Barranca, from the point where the Sagoc and Andian pipelines intersect. Barco crude is the only crude which is economical to process without a high capital outlay for additional refining facilities. If eventually crude has to be imported, one of the Andian loops could be utilized in reverse from the export terminal to Barranca.

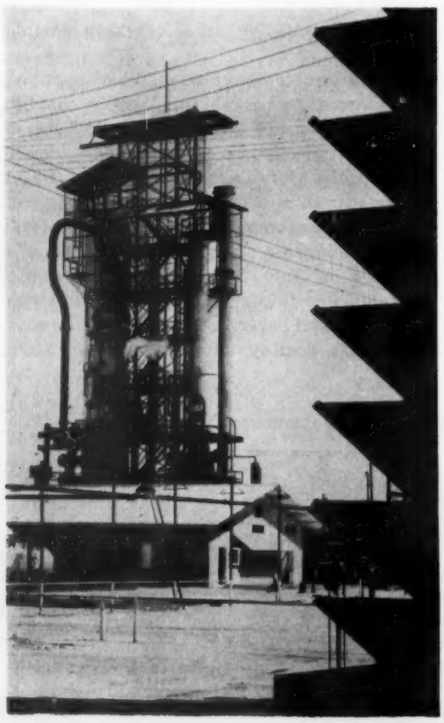
The Currie report is against the immediate construction of new refineries. It says: "Looking toward the future, all cracking facilities should be centralized until the throughput of the Barranca refinery is developed to 40,000-50,000 barrels daily, which is the most economical level."

(4) A thorough study of the possibilities of producing anhydrous ammonia to make fertilizer, using refinery and natural gas, is recommended. It is suggested also that Colombia could eliminate imports of nitrates and possibly produce ammonium nitrate and ammonium sulfate for fertilizers.

(5) The report recommends the construction of oil products pipelines from the Barranca refinery to the various principal consumption centers. The 120-mile project from upper Magdalena River port of Pt. Salgar at 640 feet above sea to Bogota at 8,659-foot elevation is now being surveyed, and engineering plans are being prepared by Williams Brothers of Tulsa. The project is being financed by a loan from Tropical Oil Co. to the departmental government of Cundinamarca, which is building the line. Estimated cost is placed at $3 million. Other products pipeline projects will call for an investment totaling some $7.5 million. The government has authorized the various departmental governments to construct the products pipelines. One of the projects is a 50-50 proposition with the central government.

From the Foster Wheeler and Currie reports an investment program of from $16 to $31 million for refinery and oil products pipeline projects is recommended. This would have to be financed by the government, if the De Mares concession and pipeline projects become entirely official. This amount may not be considered too great for the Colombian government, which has a current annual income of $200 million and a public debit of $250 million, of which only 20 percent is in dollars and 80 percent in pesos. However, the government already is financing a $42-million iron and steel project, from iron ore to finished products, through a forced subscription to the shares of the enterprise based on a 2.5 percent income surtax, which is yielding some $4.5 million, but in pesos, annually. In addition the Currie five-year program, 1951-1955, calls for an investment of $2.5 billion or some $500 million yearly, of which the government would obtain credits and through tax measures contribute one-third or some $800 million of the total.

The oil investment program of $16 to $31 million is urgent, but it will have to be financed in the immediate future for the most part through official credits. Even if only a fraction of the Currie program is undertaken, together with the $42 million iron and steel project now being carried out, the future of De Mares still poses financial problems of considerable magnitude for the government.



Atmospheric and vacuum unit which obtains a 13 percent yield of gasoline from De Mares crude. This with natural gasoline from the field furnishes 59 percent of Colombia's motor fuel supply.

New Idea in Gas Lift

FROM the operator's standpoint, the most desirable oil well is one from which the oil flows to the surface under its own power. When the oil no longer flows freely, it has to be lifted by some mechanical means such as a pump. When the well is shallow or the oil level stands high, a pump is economical; when the well is deep and the oil level low, pumping becomes expensive, and then the pump can be superseded by gas lift, provided the gas-oil ratio of the well is high enough to supply the necessary quantity of gas.

The different kinds of gas lifts now in use are familiar to all petroleum engineers; they include: gas lift through tubing or through casing; intermittent flow with surface and subsurface control; gas displacement pumps; kick-off valves or unloading valves; and, finally, a plunger lift.

The last mentioned idea was discussed by D. G. Knox, gas lift engineer of The National Supply Company, at the September 1950 meeting of the American Society of Mechanical Engineers. It is based on the idea that the full length of the well tubing should be used as a working barrel in which a free piston or plunger, propelled by gas pressure, would travel from the producing zone to the surface, bringing a load of oil each trip. Unlike the conventional barrel with traveling valve, the plunger is provided with an "upside down" valve which is held open during its descent through the fluid. It is automatically closed on reaching the bottom and is held in the closed position by gas pressure during its return to the surface. This elementary form of a reciprocating pump at first presented certain difficulties, because standard tubing is not made with the smooth finish required in a working barrel, so a piston was developed with expanding segment which would fit closely in the tubing and make good contact while passing through the varying diameters of the tubing and the couplings.

The outfit can be installed under flowing conditions without pulling the well, although it is first necessary to run broaches in order to clean scale and other foreign matter from the wall of the tubing. A cycle is begun when the plunger reaches the bottom of the well, where it is held until sufficient gas energy has been stored up to lift the weight of the plunger against the friction of the moving column and exert the total force required to sustain this movement. This required force is usually only a few pounds per square inch.

A pressure-operated cycle-controller is used in conjunction with the plunger to open and close a motor valve on the flow line. This instrument opens the motor valve when the pressure has increased to a desired point and then closes the valve when the plunger reaches the surface and unloads the fluid. This control has been found advantageous under almost all conditions. In addition to conserving gas energy, it provides positive control over plunger travel. Since the plunger is held down until there is enough gas energy to lift bigger loads, injected gas-oil ratios can obviously be reduced. In certain types of wells, primarily those having low bottom-hole pressures, it has been found that good results are obtained by installing the control equipment so as to inject gas intermittently. This reduces the back pressure that is held against the incoming fluid at the lower end of the tubing.

Other advantages realized in the operation of this plunger-lift are the removal of paraffin deposited in the upper part of the tubing and the greatly reduced amount of emulsion.

The action of the free-cycling plunger was compared with the actions of various gas-lift methods by means of long glass tubes representing an oil well. In straight gas lift the gas tends to channel through the fluid in the tubing string. As the load lightens due to aeration, the velocity of movement increases, and a series of gas and foam slugs appear in the upper portion of the flow string, and finally the gas breaks away, carrying very little fluid with it. This amounts to a considerable slippage of gas. On the other hand, when the plunger comes down the tube and strikes the footpiece, it is instantly propelled upward again, pushing the column of oil above it. There is thus little slippage of gas, which enters at the bottom of the well and can only press against the bottom of the plunger.

In a well about two miles deep, the time required for the plunger to fall again to the bottom of the hole is about five or six minutes. On its way back to the surface with an average load of one barrel of oil, it will require about 15 minutes, depending on the operation pressure of the gas and the average back pressure on the flow line.

It was mentioned above that the plunger is pushed upward by gas and fluid forced in at the bottom. If the fluid enters the tubing at a higher rate than that at which the plunger moves the fluid out, pressures against the producing sand cannot be sufficiently reduced to approach economic depletion of the well by plunger lift methods. The critical point for good plunger operation is about 1,200 feet per minute. This is important as the depth increases; and when operating pressures are reduced to obtain maximum production, the cycle time must be shortened.

One means for shortening the time cycle in plunger lift operations is to employ a multiple stage method through the use of two or more plungers operating simultaneously in the same tubing string. The lower plunger discharges its fluid load above a packer and a standing valve set at a predetermined point in the tubing string. The upper plunger operating above the top packer, discharges at the surface. Since the distance traveled by each plunger is shorter, the time required for a cycle is less; consequently smaller loads are lifted in each cycle, resulting in a lower operating pressure and an increased production rate.

These are the advantages of plunger method of lifting oil: reduction of gas slippage in the flow string, lower operating pressures, and efficient use of the lifting gas. This makes it possible to produce deep, low-productivity index wells up to the limit of economic depletion by gas propulsion.

Further, present-day drilling practice continues to limit the oil operators to the use of relatively small tubing in deep wells. Under this adverse combination of small tubing and great depth, it appears that the multiple-stage, free-piston, plunger-lift offers one of the best solutions to the problem of deep production when sufficient gas is available.

For design purposes, Mr. Knox gives the following particulars:

With the aid of data accumulated from actual plunger lift installations, the pressure depth curve shown in Chart I has been derived to indicate the minimum operating pressure per barrel per day required for a 2.5-inch plunger from various depths.

For example, lifting from a depth of 10,000 feet would require 2.27 psi per barrel per day, or 227 psi for 100 barrels per day. This is the minimum pressure required and does not include the effect of the trap pressure or the weight of the column of gas.

The theoretical maximum daily production of a well in barrels per day can be expressed as the product of the static bottom-hole pressure in pounds-per-square-inch and the productivity index. Here we assume the maximum pressure drop across the formation, and thus the maximum production rate.

Chart 2, also derived from field data, shows the percent of maximum daily production which may be recovered by plunger operation. For the sake of clarity, only the curves for 0.1 and 0.5 productivity index are shown.

Assume, for example, a well producing through 10,000 feet of 2.5-inch tubing from a formation with a productivity index of 0.1 and a bottom-hole pressure of 1,500 psi. By following the dotted line, it is determined that 82 percent of the theoretical maximum production can be recovered. By the method previously described, we find that the theoretical maximum production is $1500 \times 0.1 = 150$ barrels per day. It may be expected that 82 percent of this will be recovered, or 123 barrels per day. The operating pressure will be 2.27×123, or 280 psi.

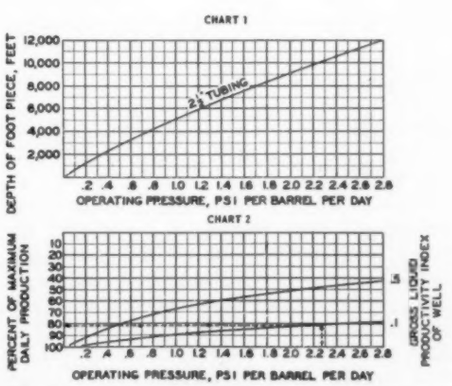


Chart 1 shows minimum operating pressure per barrel per day required for a 2.5-inch plunger. Chart 2 shows the maximum daily production obtainable by plunger operation.

Effect of Mexican Trade Agreement Termination on U.S. Oil Trade And World Pricing Policies

By Walter J. Levy

THE President, on September 6, signed a proclamation giving effect to the termination of the trade agreement between the United States and Mexico. As the result of this termination, the import duty on certain types and quantities of petroleum will rise after December 31 of this year. The determination of these quantities requires the establishment of a quota, resulting in a number of complexities with respect to administration and world oil pricing. An analysis of the problems raised by the termination of the Mexican Agreement is therefore timely.

The historical development of U. S. import taxes on oil has been reviewed in detail by the U. S. Department of Commerce.[1] A brief outline of this history shows that the basic import taxes, which are equivalent to tariff duties, were first enacted by the Internal Revenue Act of 1932. These amounted to 21 cents per barrel on crude oil, fuel oil and other liquid derivatives of petroleum, except lube oil and gasoline or other motor fuel, on which they were higher. The trade agreement with Venezuela of December 1939 reduced this tax to 10.5 cents on crude, topped crude, and fuel oil including gas oil, provided the quantity imported did not exceed five percent of the total quantity of crude processed in U. S. refineries during the preceding calendar year. Unlimited additional quantities could enter at the old rate of 21 cents.

This quota was made inoperative by the Mexican Trade Agreement of December 1942, which permitted the import of any quantity of crude, topped crude, fuel oil and kerosene at the lower rate. Moreover, the Geneva General Agreement on Tariffs and Trade, (GATT), which became effective on Jan. 1, 1948, reduced the rate on almost all petroleum products to 50 percent of the 1932 level. However, a clause was added which provides that the rate applicable to topped crude and fuel oil may not fall below that on crude. Since crude was not subject to negotiation at Geneva, a rise in its rates will bring about an automatic increase in the tax on topped crude and fuel oil as well.

The next effect of the termination of the Mexican agreement on the import tax rates on crude petroleum and its products will therefore be as follows. (See Table I)

(a) The duty on crude, topped crude, fuel oil and diesel oil (including gas oil) will be 10.5 cents per barrel for quantities with-

Table I

Import Taxes Applicable Under Statutory Rate, Present Rate, and Rate After December 31, 1950

(Per barrel of 42 U.S. gallons)

Item	Statutory Rate[b]	Present Rate	Rate after December 31, 1950
	Dollars per barrel		
Crude petroleum	0.21	0.105[c]	0.105 under quota and 0.21 over quota[d]
Unfinished oils for further processing	0.21	0.105[c]	0.105[c]
Topped crude	0.21	0.105[c,e]	0.105 under quota and 0.21 over quota
Gasoline or other motor fuel	1.05	0.525[c]	0.525[c]
Naphtha and light finished products	0.21	0.105[c]	0.105[c]
Kerosene	0.21	0.105[c,e]	0.105[c]
Gas oil, incl. diesel and finished distillate fuel oil	0.21	0.105[c,e]	0.105 under quota and 0.21 over quota[d,e]
Residual fuel oil	0.21	0.105[c,e]	0.105 under quota and 0.21 over quota[d,e]
Lubricating oils, incl. paraffin oil	1.68	0.84[c]	0.84[c]
Paraffin and other petroleum wax products	0.01 per lb.	0.005[c] per lb.	0.005[c] per lb.
Petroleum jelly, petrolatum and similar products	0.01 per lb.	Free[c]	Free[c]
Mineral oil of medicinal grade derived from petroleum	0.21	0.21[c]	0.21[c]
Petroleum liquid asphalt, incl. cutbacks and road oil	0.21	0.105[c]	0.105[c]
Petroleum asphalt, solid	Free[a]	Free[a]	Free[a]

Reference: a. 1930 Tariff Act; b. Section 3422, Internal Revenue Code; c. Mexican Trade Agreement; d. Venezuelan Trade Agreement; e. General Agreement on Tariffs and Trade.

[1] Office of Industry and Commerce: "Effects on Petroleum Imports of U. S.-Mexican Trade Agreement Termination," by Richard B. Peters, Supplement to **World Trade in Commodities: Petroleum and Coal**, Vol. VIII, Part 24, Sup. No. 1, July 1950 (with correction).

in the quota limit and 21 cents for additional quantities, as determined by the Venezuelan Agreement.

(b) The duty on kerosene, liquid asphalt (including cutbacks and road oil), naphtha and light finished products, and unfinished oils for further processing will remain, under GATT, at 10.5 cents for unlimited quantities.

(c) The rates on gasoline, lube oils, mineral oils of medicinal grade, and petroleum jelly, petrolatum and similar products will remain at their existing levels, as established by GATT.

There may be some question as to the effect of the general provisions of the GATT agreement on the new import tax rates on some petroleum products. Article II of the GATT agreement provides that the products on which concessions are granted are "exempt from all other duties or charges of any kind imposed on or in connection with importation in excess of those imposed on the date of this agreement or those directly and mandatorily required to be imposed thereafter by legislation in force in the importing territory on that date." The clear intention of this article is to prevent the duty concessions from becoming inoperative by the enactment of new or additional taxes on importation. However, it seems doubtful whether this article could be invoked to claim exemption from the tax-increasing effect of the abrogation of the Mexican Trade Agreement, because the 21-cent duty was the statutory rate of duty at the time of the GATT agreement. It had merely been temporarily suspended by the Mexican Agreement.

The overall quota for imports of crude and fuel oil into the United States during 1951 at the reduced tax will have to be based on the quantity of crude oil processed by United States' refineries during 1950. While this figure will not be available until January 1951, it is, according to the latest Bureau of Mines estimate, likely to reach at least 5,540,000 barrels daily. The quantity of crude and fuel oil which will be able to enter the United States at the rate of 10.5 cents per barrel will therefore amount to 277,000 barrels per day. Assuming that the rate of imports will continue at the level of the first six months of this year, 467,000 barrels daily, or 63 percent of the imports of crude and fuel oil (exclusive of bunker shipments) would have to pay the higher rate of 21 cents per barrel. The average duty on imports of crude and fuel oil will thereby be raised from the present 10.5 cents to 17.1 cents per barrel.

The Venezuelan agreement defines the quantity of crude and fuel oil which can enter the United States at the rate of 10.5 cents per barrel during any calendar year. It does not, however, specify the basis on which imports from individual countries are to be admitted. It is true that the Netherlands Trade Agreement required the allocation of any tariff quota among countries, and such allocations were accordingly made between 1939 and 1942. This agreement, however, became inoperative when the GATT agreement came into force. The United States has therefore a choice either of establishing country quotas or of putting oil imports on a "first-come-first-served" basis.

According to the Venezuelan agreement, country quotas, if used, must be based on

Walter J. Levy, formerly with the United States Department of State as chief of the Petroleum Branch, Economic Cooperation Administration, is now an oil consultant with offices in New York City.

"the proportion of the total imports of such article from all foreign countries supplied by the other country in a previous representative period." The agreement does not, however, further define that period. Obviously, the year or other period taken as a basis for the allocation of the quotas would be of vital importance. Table II illustrates how the share of the various countries in the five-percent quota would be affected by the choice of one of several possible base periods.

Table II

Share of Producing Areas in U.S. Imports of Crude and Fuel Oil

(Percent of total imports)

		Base Period		
	1939	1946-49	1949	1950
Country	(10 mo.)	(average)		(Jan.-June)
Venezuela	71.9	59.3	51.1	47.1
N. W. Indies	20.3	18.6	20.9	27.3
Colombia	4.0	7.1	5.6	6.1
Mexico		4.4	3.7	4.0
Middle East	3.8	10.0	18.0	14.5
Others		0.6	0.8	1.0

As compared to 1939, these percentages indicate significant shifts in the flow of crude and fuel oil into the United States. The strongest long-term change is the relative decline of imports from Venezuela and the Netherlands West Indies and the simultaneous increase in shipments from the Middle East, although the first half of 1950 seems to indicate a reversal of this trend. Mexico and Colombia have held their own.

The system of country quotas would tend to favor those countries which had a high rate of shipments to the United States during the base period and to work against those which had a relatively low volume. In view of the many delicate questions arising from the discriminatory power inherent in any country quota system, the United States might prefer the "first-come-first-served" system of quota administration.

If the United States should elect this system, the import situation would be determined by the manner in which the various shippers from the Caribbean and the Middle East would be able to arrange their schedule of shipments. The natural tendency to ship as much as possible as early as possible in the quota period would probably favor Venezuela, since it would be easier to time shipments from this source because of the much shorter distance. Venezuela would, of course, possess a great advantage over more remote areas on a per unit of tanker basis, but the need for keeping shipments in line with planned production and for avoiding excessive storage would make it unlikely that such a theoretical advantage could be realized to any large extent.

Under the "first-come-first-served" system, some peculiar problems might arise in connection with present Venezuelan royalty arrangements. These arrangements permit, for the purpose of royalty calculations, a prorata deduction of the U. S. duty on Venezuelan crude imported into the United States. If this arrangement would be maintained, the additional duty of 10.5 cents on such crude would be borne by the Venezuelan Government to the extent of the royalty, i.e., of one-sixth, or 1.75 cents per barrel. On the other hand, the companies must bear the full extent of the duty increase in the case of Venezuelan fuel oil and Near East crude oil imported into the United States. Accordingly, under existing Venezuelan royalty arrangements, it would be slightly more advantageous for the companies to ship fuel oil and Near East crude rather than Venezuelan crude until the quota would be filled. The same tendency would exist, as far as Venezuelan crude versus Venezuelan fuel oil is concerned, even if country quotas were adopted. However, the effect of any such shift on royalty payments could be avoided if the duty allowance for Venezuelan crude oil would be based on either the average import tax paid during a quota period on all imports of crude and fuel oil into the United States from all sources, or on the duty actually paid for Venezuelan crude and fuel oil, whichever is lower.

The period for which the quota was fixed when the Venezuelan agreement was in operation was the full calendar year. Under the terms of the agreement, however, this period may be as short as three months. The question arises whether anything but a full-year period on a first-come-first-served basis could be used, since the higher duty is applicable only to quantities "in excess of five percentum of the total quantity of crude petroleum processed in refineries in continental United States during the preceding calendar year," while under a quarterly quota the higher rate would become effective before the full five percent had entered. However, the same result would also occur under a system of country allocations, regardless of the period. As a matter of fact, some countries actually paid the higher rates during 1942 when their full quota shipments had been made, while others were prevented from shipping their

quota quantities by the tanker shortage.

The quota under which petroleum can enter the United States at the reduced rate will not give Caribbean producers and refiners sufficient outlet for their production. On the other hand, the rise in the duty cannot be considered prohibitive. It must be expected, therefore, that foreign producers will exceed this quota, notwithstanding the higher duty payable on the excess, and that the total volume of their sales will not be reduced by the higher duty. The new U. S. import tax situation may, however, have some important effects on their netback and on prices and pricing of crude and fuel oil in general

At present, Caribbean crude and fuel oil sold to United States destinations are generally priced on the basis of the Gulf price less the U. S. duty of 10.5 cents, which brings the Caribbean product up to par with the Gulf product in the United States East Coast market. This same pricing basis also applies to crude oil sold to destinations other than the United States and to fuel oil sold to the United States for foreign bunkers, although such crude and fuel oil are not subject to the U. S. duty. However, no such U. S. duty allowance is made at present by Caribbean refiners in their prices for fuel oil sold to destinations other than the United States.

The effects of the new United States import tax system need not be felt until the quota has been filled. The question arises whether thereafter the Caribbean producer and refiner will absorb the higher import tax, or whether he will pass it on to the U. S. importer. Under normal conditions the Caribbean producer would absorb the higher duty because he needs the U. S. market, and he would apply the same lower price for sales to other destinations, after a period of adjustment. The complexity of the quota system, and the uncertainty arising from the indeterminate nature of the new import taxes to be paid may interfere with this tendency. If the companies should not absorb the higher duty but pass it on to the importer, pressure might ensue, resulting in a rise in the level of the U. S. Gulf price. However, as long as the Caribbean price system remains tied to U. S. Gulf prices, such an increase would also raise the Caribbean price. A price spiral would therefore develop if this rise at the Gulf were followed by the Caribbean producer. However, if instead of following further increase, he then decides to absorb the full import tax, he would be in a much better position to do so.

More specifically, the new tariff quota system and the higher rates resulting therefrom would seem to present foreign producers and refiners with the following three most apparent choices:

(a) Continuing the pricing system based on U. S. Gulf price less U. S. import tax for shipments of crude to all destinations and for fuel oil for shipments to the United States. This would imply that foreign producers and refiners would deduct the amount of the import tax actually paid, i.e., 10.5 cents per barrel until the quota is filled and 21 cents thereafter. Such a pricing system would tend to favor the late buyer of crude oil outside the United States and would give rise to a great degree of uncertainty.

(b) Instead of basing prices on the tax actually paid, as under (a), i.e., 10.5 cents per barrel under the quota and 21 cents thereafter, computing the average rate of U. S. import duty, or about 17 cents per barrel for 1951. The effect of this would be, however, that Caribbean crude and fuel oil would sell in the U. S. market at 6.5 cents less than the corresponding U. S. products, before the tariff quota had been filled and they would be above the price from domestic sources thereafter. Consequently, this would not appear to be a likely solution.

(c) Maintaining, at least for the time being, prices at the present basis of Gulf less 10.5 cents per barrel for crude oil to all destinations and for fuel oil to the United States. This would correspond to the actual import duty payable until the quota had been filled. After the quota had been filled however, Caribbean producers and refiners would have to reconsider their pricing practices, at least for their supplies to the U. S. market. They may, therefore, be forced to adopt the system as per (a) above for their sales to the U. S. market while maintaining their present price basis of Gulf less 10.5 cents for supplies of crude oil to all other destinations. This would be a departure from the "one price to all destinations" system which at present applies to crude oil; but, under the circumstances, it might be the most likely outcome.

In view of these difficulties, the quota system may well cause Caribbean producers and refiners to change their present system of quoting "f.o.b. Caribbean" to a "laid-down duty paid" basis for supplies to the United States.

Insofar as Caribbean fuel oil is shipped to the United States, it goes exclusively to the East Coast, where it supplies the offshore trade and also a portion of the domestic market.

In the offshore trade it could, under the present pricing system, be supplied at prices 10.5 cents below the domestic level, since no duty is collected on it. This differential is not reflected in U. S. East Coast quotations, but it is understood that in most cases this extra margin is in fact passed on to the long-term contract consumer, and that competition in the offshore trade has depressed the bunker price even below this level.

The new import tax quota system does not alter the status of Caribbean fuel oil sold to the United States for offshore use, which will remain duty free. The question arises whether Caribbean producers and refiners will maintain the present price, which includes a duty allowance of 10.5 cents or whether they will grant an allowance of 21 cents after the quota has been filled. In the former case, there would in the Caribbean be two fuel oil prices for shipments to the United States, one for use in ships' bunkers and one for the domestic market.

On the other hand, substantial quantities of Caribbean fuel oil will enter the United States for domestic use, on which the marginal netback may become Gulf less 21 cents duty allowance. Under these conditions, it might be more advantageous if such fuel oil would be sold for offshore use in United States' ports further south, on which no duty is payable, rather than for domestic use in say, the New York market. The United States domestic market could in that case be supplied from domestic sources. This shift could take place up to the point where the saving in the duty allowance would be offset by the additional transportation cost.

The effect, if any, of the increased U. S. import tax on Middle East crude and fuel oil pricing seems very remote.

Middle East crude oil prices are likely to fluctuate between a high which will just permit Western Hemisphere crude oil to be shipped to Western Europe, and a low which will just permit Middle East crude oil to move into the Western Hemisphere. The higher of these limits will probably remain unaffected, at least for the time being, by the U. S. import tax revision. The lower of these limits will drop by 10.5 cents after the tariff quota has been filled. It is unlikely, however, that the actual Middle East crude prices will be affected by the U. S. import tax revision.

At the present level of U. S. fuel oil prices, Middle East fuel oil has not been shipped into the United States. The netback on such shipments, if made, would amount to the price at the East Coast minus transportation and import duty. At a price of heavy fuel oil of $2.15 per barrel in New York harbor, and at flat USMC freight rate from Ras Tanura of $1.95, only 20 cents would remain to pay the increased import tax of 21 cents and the cost of the fuel oil.

Conclusions

The general effects of the increased import tax on crude and fuel oil may be summarized as follows:

(a) The effect of the rise in the import tax from 10.5 cents to 21 cents per barrel cannot be determined at this time, but it seems most likely that the foreign producers and refiners will receive a lower netback, as compared with U. S. Gulf prices.

(b) It cannot be predicted now whether the Caribbean price for foreign bunker shipments at the U. S. East Coast will include only the present duty allowance of 10.5 cents per barrel or whether the full 21 cents import tax will be allowed, after the quota has been filled.

(c) The price of the Caribbean producers and refiners for sales to foreign destinations likewise cannot be predicted at this time. However, there exists the possibility that different prices will result for U. S. domestic and offshore shipments, and for U. S. and foreign destinations.

(d) The increase in the import tax to 21 cents on crude and fuel oil, after the quota has been filled will not affect the tax on kerosene, liquid asphalt, and naphtha and light finished products, which will remain at 10.5 cents per barrel. This will result in the anomalous situation that more valuable products become subject to a lower duty than less valuable products. Similarly, the tax on unfinished oils for further processing will remain at 10.5 cents, while that on crude petroleum will rise to 21 cents, after the quota has been filled.

It is obvious that the implications of the establishment of a quota system for U. S. oil imports are far-reaching. Some difficult problems are created for those who must operate under and administer such a quota system, and certain of the effects on world supply and oil prices are bound to be confusing.

The Petroleum Industry in Relation to National Defense

By B. Brewster Jennings
President, Socony-Vacuum Oil Company, Inc.

MANY spokesmen for the industry have said United States oil is in good shape to meet all demands. While this is true in general, we all know that we are right now up against it to supply top grade aviation gasoline in the volume desired, and we know equally well that to oil a full-scale war effort will require a pretty drastic rationing to civilians.

Because oil is so completely essential to the successful prosecution of war, both abroad, as we hope any war will be, and at home, where the sinews of war originate, it is extraordinarily important that oil be so integrated with the national war effort that our industry is not hampered, but can function as efficiently as in peace.

Because of the interdependent relationship of all branches of the oil business, our industry should be dealt with as a whole in coordinating it with our national defense. Only thus can optimum results be obtained. In the report of the National Petroleum Council committee on national petroleum emergency, this point was developed at some length and emphasized as strongly as possible. It was reaffirmed in a report submitted to and adopted by the Council on Sept. 28, 1950. It is good to see that in the Defense Production Act of 1950 recently signed by the President, providing for full mobilization of industry when necessary, this aspect of the petroleum industry was very largely recognized.

As the situation is today, just how should we look at national defense as it concerns oil? We are not in a world war. No major nation is a declared enemy. Things could quiet down and remain quiet for years; or the heat generated in Korea could ignite a devastating conflagration. This leads to the conclusion that our consideration of oil in relation to national defense should be both short range, that is, in connection with the immediate situation, and long range, with a view to placing us in the strongest possible position to meet a future crisis.

Take the short range aspects first. Even with the limited Korean conflict, our industry is under considerable pressure in particular spots. It is no secret we are finding it extremely difficult to make the present day military grades of aviation gasoline in adequate volume. This is primarily because our alkylation plants, while perhaps too few in number, cannot be operated at capacity on a self-contained basis. In other words, there is more alkylation capacity in the country today than is being used, because in many instances the refiner owning that alkylation capacity does not produce sufficient feed stocks from his normal operations to utilize his full capacity for making alkylates. The principal aviation gasoline of World War II was 100/130 grade, requiring relatively minor percentages of alkylate blended with good base stocks. The 115/145 grade of today requires upward of 80 percent alkylates, which is a very different proposition. Though the major part of the aviation gasoline needs are in the top grade, there is a substantial need for the 100/130 grade too. Furthermore, the air lines, though requiring for the most part 100/130 grade, have wanted that grade with only three cc TEL/gal.

Without getting into undue detail, it is obvious that our industry must, apart from augmenting its production of alkylate to the maximum, do everything that can be done to minimize the use of alkylate in any but the 100 and 115 grades of aviation gasoline. For the industry to do the best possible production job, several things must be done:

(1) No matter who owns them or where they are located, all available B-B fractions and substantial quantities of catalytic polymers must be made available to the alkylation and synthetic rubber plants. The catalytic polymers, of course, would go only to the alkylation plants.

B. Brewster Jennings

(2) Likewise regardless of who owns them or where they are located, the best gasoline stocks must be made available for blending for aviation gasoline. Similarly all possible supplies of aromatic blending agents are required. Regardless of peacetime economics, idle plants for making these blending agents must be reactivated.

(3) Assuming approval by the Civil Aeronautics Authority, maximum lead up to 4.6 cc per gallon must be permitted in commercial aviation gasoline.

The necessity for doing these things is beyond argument. The question is how to do them. Personally, I see no way except through government cooperation with the industry. There just has to be a central coordinating organization which will determine how these charge stocks will move to war production facilities, and what base stocks will be used for blending. No two oil companies are the same in their ability to make high grade aviation gasoline or its components. Nationwide marshalling of the industry's aviation gasoline and synthetic rubber manufacturing abilities will affect all companies differently. Some will be up against it to make satisfactory motor gasoline after the cream of their components has been skimmed off. Others will be comparatively unaffected. Even if the Korean war and the resulting rearmament program do not grow beyond what is now envisioned, we shall be faced with a component allocation program and at the same time a limit on motor gasoline quality. Certainly neither of these things can come about except by government assistance and authority. That is where the government must step in, and I think we should be thankful that we shall be dealing with one agency in these vital matters.

I have talked at such length about the aviation gasoline problem because it happens at the moment to be the most acute. There are, however, many other problems, and some of them may well become more serious. Steel for the industry's growing needs is certainly a major problem. Pressure tankcar availability is another and will grow in importance as charging stock allocations are made.

The long range aspects of oil in relation to national defense are certainly as important as the short range and to my mind even more so. Let me suggest the objective of a long range oil policy purely from a defense perspective. It would be:

To so conduct the industry in peacetime that it would be able, with a minimum of dislocation, to supply the oil requirements of the nation with products of required quality and in adequate volume wherever needed in time of emergency.

Admittedly that sounds like Utopia and may be impossible, but let's see where we stand today after five years of so-called peace.

Certainly we seem to be all right so far as raw material is concerned. Those who should know say that we have about one million barrels a day of domestic crude producing capacity within the maximum efficient rate over and above current production, a cushion of about 15 percent. Transportation capacities are in pretty good shape outside

(Please turn to page 74)

Steel is Oil

American Iron and Steel Institute photo.

By Minor S. Jameson, Jr.

THE petroleum industry's total steel needs for 1951 are estimated at 11,650,000 tons of steel mill products. This estimate, prepared recently by a committee of the National Petroleum Council, covers all direct and indirect uses of steel by all branches of the American petroleum industry.

The magnitude of this figure offers a partial explanation of the above title, "Steel Is Oil." More important than the mere size of these requirements, however, are the considerations involved in their determination and the answers to such questions as: Are these steel requirements based on some unusual expansion program? What results may be expected if this steel is made available? What would happen if the petroleum industry should be restricted in the use of steel? These questions apply with equal force to all branches and operations of the industry.

In preparing estimated steel requirements, the Council's committee took into consideration the projected domestic and export demand for petroleum which was estimated by the oil and gas division of the Interior Department to average between 7,000,000 and 7,100,000 barrels per day in 1951. The petroleum facilities for producing, transporting, refining, storing and distributing were geared to this level of total consumption. Based on this rate of oil consumption, the steel required in each phase of the industry's activity was estimated to be as follows:

Domestic Operations	Total Requirements Year 1951 Steel Mill Products (tons)
Oil and Gas Production	3,240,000
Oil Transportation	1,863,000
Gas Transportation	3,023,000
Refining	654,000
Marketing	2,257,000
TOTAL DOMESTIC	11,037,000
Foreign Operations (50% U.S. Owned)	613,000
GRAND TOTAL	11,650,000

The Council's printed report contains the further breakdown of these totals into the various steel product classifications and quarterly periods, together with an explanation of the assumption and methods of calculation employed. In each phase of the industry's activities, careful consideration was given to existing capacities and the need for steel for both maintenance and expansion. The importance of this steel in relation to each functional activity could be developed at length but certain aspects of the material requirements for domestic production will serve to illustrate the essential nature of these requirements.

Expansion has been one of the outstanding characteristics of the petroleum industry. In some industries progress is measured in terms of a "normal" year. In the oil and gas industry no past year can be considered normal. This year, as in most years throughout the industry's history, new records are being set. The drilling of new wells, the production and refining of crude oil and the transportation and distribution of the hundreds of petroleum products are all at levels more than a third above operations at the time of Pearl Harbor. Every indication points to further increases by 1951, as evidenced by a recent forecast prepared by the Economics Committee of the Independent Petroleum Association of America which shows an increase in total petroleum demand during the 12 months beginning Oct. 1, 1950, of 5.7 percent as compared with the preceding 12-month period.

A continually expanding industry obviously requires expanding facilities. What may be less obvious is the fact that the petroleum industry requires huge tonnages of steel merely to maintain capacity of existing levels. Necessary repairs, maintenance and modernization of plants, equipment and machinery create a continuing demand for steel in many forms. Without this steel, there would be a decline in both capacity and efficiency. While this situation affects all phases of oil activity, it is of particular significance in the production branch of the industry because of the natural decline in the output of older wells.

A study of the steel needed for oil and gas production reveals immediately how important this steel is from the standpoint of total oil productive capacity. For example, the nation's oil-producing capacity during the four years of World War II failed to increase, remaining at approximately the same level during the years 1942-45. At the time of Pearl Harbor capacity exceeded actual production by more than one million barrels daily. Four years later this gap had been closed due to the steady increase in petroleum demand despite the fact that during those four years approximately 95,000 wells were drilled, involving a total footage of more than 300 million feet and more than 5,000,000 tons of steel. This drilling and this use of steel accomplished only the maintenance of capacity by offsetting the natural decline in the output of older fields and wells. Because of wartime restrictions, the activity was insufficient to increase productive capacity and provide the normal and necessary cushion over and above consumption. As a result of this situation which was accompanied by a similar absorption of reserve capacity in transportation and refining, temporary spot shortages of some petroleum products developed during the winter of 1947-48.

With the removal of wartime restrictions, the steel requirements of the industry increased sharply because of the deferred expansion of facilities. During the three years from the close of 1945 to the close of 1948 productive capacity increased by approximately 1,100,000 barrels daily. Before this could be done, wells had to be drilled to offset the natural decline in production in older properties amounting to about the same figure of 1,100,000 barrels daily from Dec. 31, 1945 to Dec. 31, 1948. Drilling during those three years, therefore, created a total new capacity of approximately 2,200,000 barrels daily. Half the drilling was necessary merely to maintain productive capacity at the December 1945 level by overcoming the natural decline. The other half of the wells drilled created the net addition to capacity of 1,100,000 barrels per day to meet increasing demand.

This experience of the industry, involving certain overall relationships, provides a basis for analyzing steel requirements and estimating the probable needs of the future. The estimated steel needed for oil exploration, development and production as set forth in the report of the committee of the National Petroleum Council was based on the assumption that the development of new oil and gas reserves would be related to drilling activity as in the past. This assumption does not imply that a fixed quantity of new oil or new productive capacity will automatically result from a given amount of steel or a given amount level of drilling operations, as productive capacity in the last analysis is dependent upon the degree of success in finding new oil fields. However, the National Petroleum Council's study concluded that there was no evidence that would indicate substantially different results in the years immediately ahead as compared with the average of recent years.

The charts A, B and C have been prepared to illustrate important relationships between oil and steel supplies. Chart A shows the trend of the supply of oil field tubular goods as compared with drilling over the past 15 years. Chart B pictures the next relationship—drilling activity vs. additions to proved reserves. Chart C completes the sequence by comparing additions to reserves with production and productive capacity.

It is obvious from Chart A that drilling activity has tended to increase or decrease in accordance with changes in oil producers' income and the availability of materials. Producers' income is expressed in constant dollars so that changes in the value of the dollar will not distort the relationship. The correlation between income and drilling was pointed out in a report of the National Petroleum Council on U. S. Crude Petroleum Reserve Productive Capacity in January of this

year. That report concluded that the footage and number of wells drilled declined when the income from crude production decreased due to a need for less oil or a lower price. When the value of oil production increased due to the need for more oil or an increase in price, the footage and number of wells drilled also increased. A corresponding demand is created for more or less of the materials used by the production branch of the industry. The Council's study of steel requirements concluded that an average of 11.2 tons of casing, tubing and drill pipe were required for each thousand feet drilled. This figure takes into consideration past usage and the increasing depth of wells which nationwide is expected to average eight percent deeper in 1951 than in 1947.

In addition to the relationships shown in Chart A, there has been a relationship between drilling activity and the total additions to proved reserves, as shown in Chart B. In 1937 when 35,213 wells were completed with a total of more than 105 million feet drilled, total additions to reserves amounted to 3.7 billion barrels. Under severe wartime restrictions drilling activity was curtailed to the low level of 20,349 wells in 1943, involving a total footage of only 62 million feet. In that year total additions to reserves declined to 1.5 billion barrels. Exploration and development during the postwar years increased to a level of 39,477 wells and 136.7 million feet in 1948 when total additions to reserves amounted to 4.3 billion barrels. For the entire 15-year period 1935-49, the totals have been:

	1935-1949
Total additions to reserves	36,777,000,000 Barrels
Total number wells drilled	446,000 Wells
Total footage drilled	1,421,000,000 Feet

On the average these figures indicate an addition to reserves of 82,500 barrels per well or 25.9 barrels per foot drilled.

Chart C carries the analysis one step further by comparing the additions to proved reserves with actual production and productive capacity. As will be noted, the estimated productive capacity during the four wartime years, 1942-45, showed little change. Drilling activity was relatively low, and the total additions to proved reserves of 7.5 billion barrels were only slightly greater than the total production of 6.6 billion or a ratio of 1.1 between new reserves and production. In the following four years, however, productive capacity increased steadily. During these four years the total additions to reserves of 13.2 billion barrels were substantially greater than the total of 8.0 billion barrels produced. This higher ratio of 1.65 between additions to reserves and production made it possible not only to offset the natural decline in old oil-producing properties but also to create additional productive capacity to meet increasing oil consumption.

In summary it can be seen that oil productive capacity is dependent upon the volume of newly discovered and developed petroleum reserves. In order to provide increasing productive capacity, this newly discovered and developed oil must be substantially in excess of the quantity produced. The volume of newly discovered and developed oil, in turn, is related to exploratory and development effort, and to the level of drilling activity. Until there is conclusive evidence to the contrary, the average relationships that have existed during recent years provide the best indication of the overall results to be expected from future drillings. Future drillings activity will be related to the total income of oil producers and to the availability of materials. The quantity of steel materials made available to the oil-producing industry, therefore, will be one of the factors upon which the nation's oil producing capacity depends. The National Petroleum Council's 1949 report on A National Oil Policy for the United States contained this significant reference to materials:

"The national security and welfare require a healthy domestic oil industry. . . . To this end, adequate and equitable availability of essential materials is a fundamental requisite."

Minor S. Jameson, Jr., author of this article, recently was appointed assistant to the president of the Independent Petroleum Association of America, a newly-created post. He has served the association as economist since 1937 except for three years in the army. Is serving currently as secretary of the National Petroleum Council committee on Petroleum Industry Steel Requirements.

Chart A

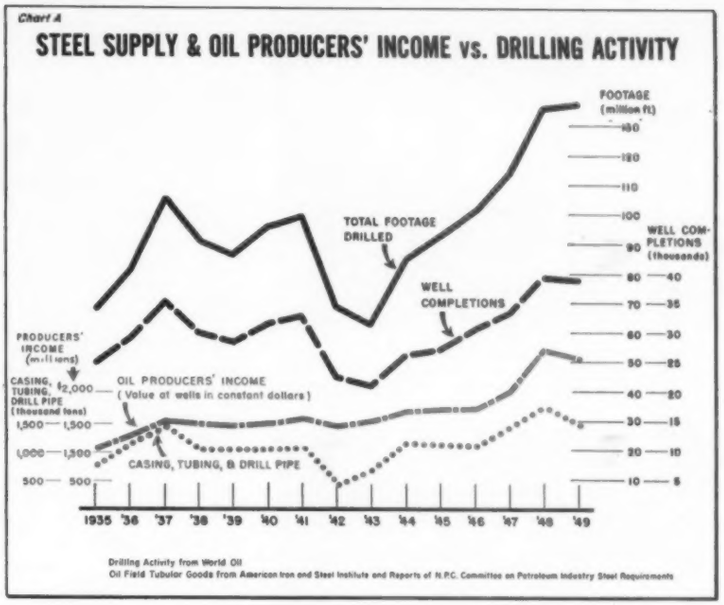

STEEL SUPPLY & OIL PRODUCERS' INCOME vs. DRILLING ACTIVITY
FOOTAGE (million ft)
TOTAL FOOTAGE DRILLED
WELL COMPLETIONS
WELL COMPLETIONS (thousands)
PRODUCERS' INCOME (millions)
CASING, TUBING, DRILL PIPE (thousand tons)
OIL PRODUCERS' INCOME (Value at wells in constant dollars)
CASING, TUBING, & DRILL PIPE
1935 '36 '37 '38 '39 '40 '41 '42 '43 '44 '45 '46 '47 '48 '49
Drilling Activity from World Oil
Oil Field Tubular Goods from American Iron and Steel Institute and Reports of N.P.C. Committee on Petroleum Industry Steel Requirements

Chart B

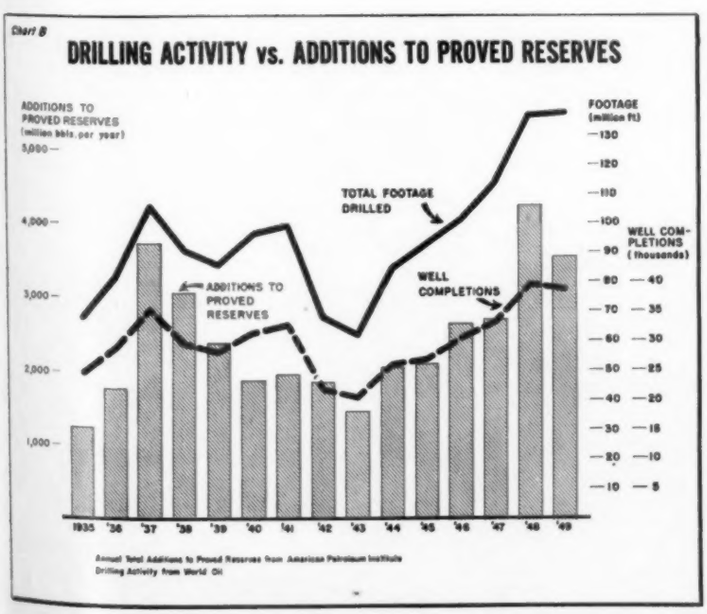
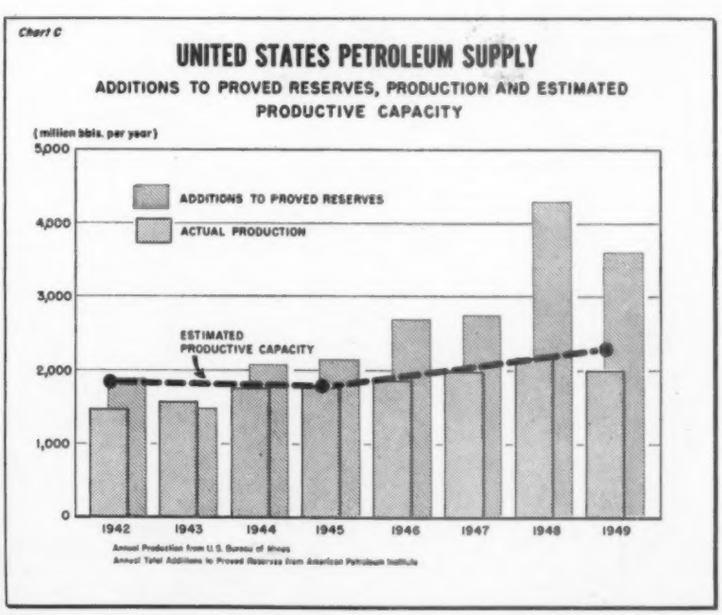
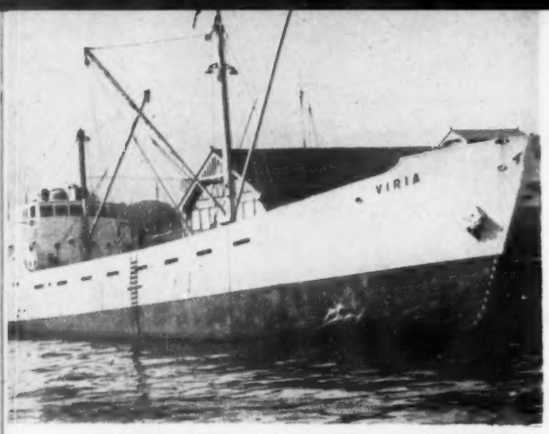

DRILLING ACTIVITY vs. ADDITIONS TO PROVED RESERVES
ADDITIONS TO PROVED RESERVES (million bbls. per year)
FOOTAGE (million ft)
TOTAL FOOTAGE DRILLED
ADDITIONS TO PROVED RESERVES
WELL COMPLETIONS
WELL COMPLETIONS (thousands)
1935 '36 '37 '38 '39 '40 '41 '42 '43 '44 '45 '46 '47 '48 '49
Annual Total Additions to Proved Reserves from American Petroleum Institute
Drilling Activity from World Oil

Chart C


UNITED STATES PETROLEUM SUPPLY
ADDITIONS TO PROVED RESERVES, PRODUCTION AND ESTIMATED PRODUCTIVE CAPACITY
(million bbls. per year)
ADDITIONS TO PROVED RESERVES
ACTUAL PRODUCTION
ESTIMATED PRODUCTIVE CAPACITY
1942 1943 1944 1945 1946 1947 1948 1949
Annual Production from U.S. Bureau of Mines
Annual Total Additions to Proved Reserves from American Petroleum Institute

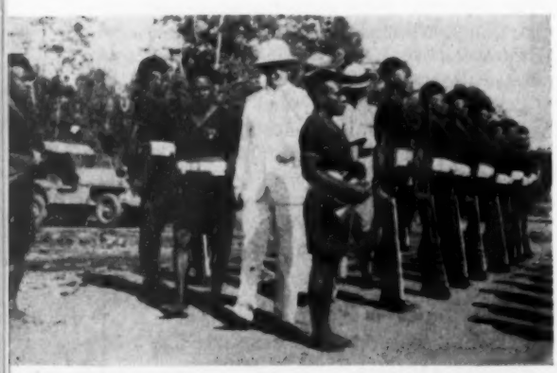
First Marine Terminal

Vacuum Oil Company is rebuilding marketing properties built up over 40-year period, which were destroyed in World War II, and expanding operations as island economy is developed.



The 650-ton Viria and a smaller vessel the Erica distribute products from the new Lae terminal to other New Guinea ports and adjacent islands.

Pictured at the terminal opening ceremonies are, left to right, W. C. Fraser, Pacific islands manager for Vacuum; C. R. Heavy, New Guinea manager; Col. J. K. Murray, administrator of Papua and New Guinea; and H. C. Smith, Vacuum operations director.



Local authorities at Lae honored Col. Murray when the terminal was opened by assembling a guard of honor for his inspection.

To serve the expanding economy of Papua and Australian-mandated New Guinea, Vacuum Oil Co., Pty. Ltd., Australian subsidiary of Standard-Vacuum Oil Co. has built a bulk terminal at Lae and has begun the construction of a second plant at Port Moresby. The war-destroyed depot at Rabaul, New Britain, has been rehabilitated, and new depots have been built at Madang and Wewak, New Guinea. The Lae installation is the first commercial deep water bulk storage terminal for petroleum products to be built on the world's second largest and perhaps least-known island.

In the past all oil consumed in the eastern half of the great island has been delivered in drums or smaller packages. The Lae and Port Moresby terminals will cut transshipment costs by permitting tankers to pump cargo direct to shore tankage from which part may be delivered by tank truck to the principal communities and over coastal roads to nearby plantations and industrial plants. For more distant areas not reached by roads, deliveries will be made in packages by coastal vessels.

The consuming potential of New Guinea and Papua is not large in comparison with modern world standards but petroleum products play a very important part in the island's economy. White population of the area controlled by Australia is only about 10,000, and the native population is not definitely known because much of the interior has not yet been explored. Estimates are that native population of the entire area is on the order of 1,300,000. Per capita oil consumption of petroleum is about as low as anywhere in the world. Exports to the outside world in fiscal 1949 totaled only £2,632,928 (Australian), about two pounds per capita, a sum which does not allow for the importation of great quantities of the products of foreign countries.

* (See WORLD PETROLEUM, Sept. 1950, p. 66.)

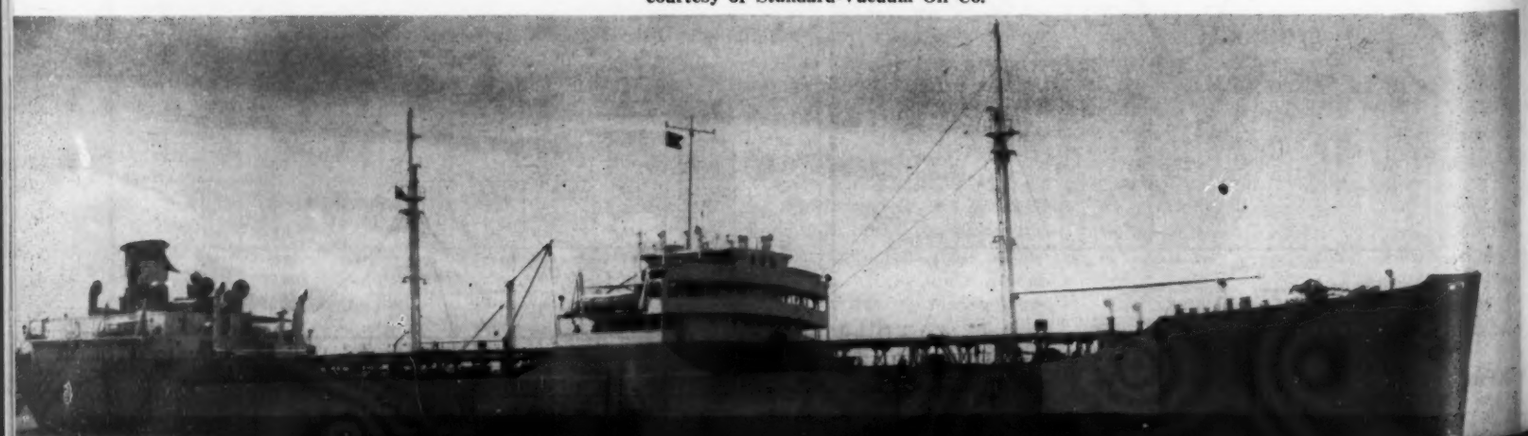
While Vacuum Oil and associated companies are diligently searching for oil in Papua, no commercial production has been developed as yet.* Thus far the greatest producers of wealth are copra and gold. Forest products now are being developed, but much of the timber is being consumed locally in the postwar development program fostered by the Australian government under its League of Nations mandate and territorial administration.

The north coast of New Guinea particularly and adjacent islands such as New Britain were the scene of intense fighting during World War II. The gold mining industry was almost entirely destroyed, and coconut groves deteriorated or were destroyed. Only now are these industries getting back on their feet.

Equipment for the alluvial and placer gold mining has been flown in to the Wau and Bulolo valleys deep in the mountain fastness. When these fields were first discovered and developed almost 30 years ago, New Guinea led the world in air freight. Aviation gasoline and lubricants still constitute an important segment of the New Guinea market. Much of the inter-island transport as well as the movement of men and materials between coastal towns and into the interior is by air. Every town has its air strip for land planes. There are 47 such in the territory and, of course, much of the coastal and inter-island air transport is by seaplanes.

When the tides of war receded from the ruins of New Guinea's gold mining plants, towns and plantations, a large quantity of surplus war material was left behind. Included were bulldozers, tractors, trucks and Quonset huts, all of which have been most useful in helping to restore the economy. Earth-moving equipment has been particularly useful in repairing old roads and building new ones. In a country where the rainfall is 200 inches per year, it is necessary to

The 16,000-ton Lifjord of the Stanvac fleet which delivered the first cargo of oil to the new Lae terminal. Except as otherwise noted all photographs with this article are reproduced through courtesy of Standard-Vacuum Oil Co.



in New Guinea

Much of the travel in New Guinea is by air. Pictured here is a native canoe putting out from shore with passengers for the Catalina flying boat "Island Chieftain". Australian official photograph.

work unceasingly if roads are to be kept passable through the dripping jungle. The road system is still rudimentary, however, as may be inferred from the fact that imports of automobiles, trucks and motorcycles and repair parts in fiscal 1949 were valued at only £119,240, while imports of airplanes and parts were valued at £219,600.

As mentioned previously, the copra industry is the largest on the island, and this is not an industry which is very greatly mechanized, so it does not represent a significant market for petroleum products. Cultivation of the coconut groves is not intensive, and harvesting of the nuts is largely a hand operation. The copra itself is best when sun dried and does not require fuel oil. One factory for the recovery of coconut oil now is operating, and two others are being built.

The gold and silver mining industry is a substantial consumer of lubricants and other oil products. One of the giant dredges in the Bulolo valley weighs 3,000 tons and handles 7,000 cubic yards of material daily. The gold and silver mines inland from Lae, where Vacuum Oil has erected its new bulk plant, produced 91,295 fine ounces of gold and 38,691 fine ounces of silver in fiscal 1949.

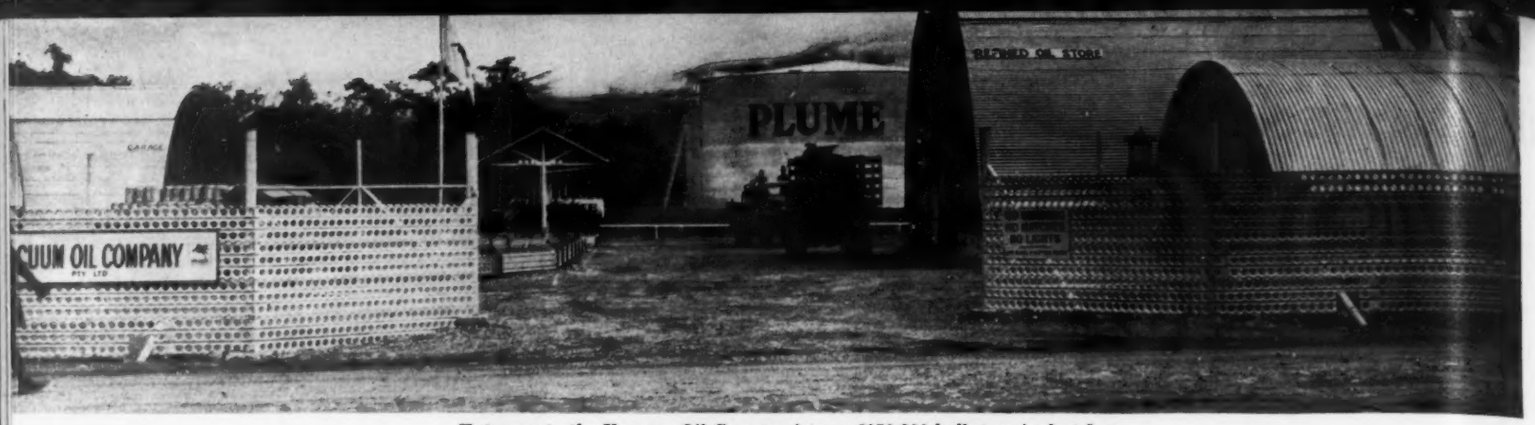
Both Bulolo Gold Dredging Ltd. and Guinea Goldfields Ltd. have gone in for logging and timber processing since the war. Prefabricated houses and standardized furniture are manufactured and flown from the sawmills to various parts of the island. Last year 16 sawmills in New Guinea processed 10 million superficial feet of logs.

An indication of the speed with which New Guinea is recovering from its war wounds may be seen in the recent record of oil imports. In 1947 imports of aviation and motor gasoline totaled 173,000 barrels, while in 1949 this had grown to 255,000 barrels, an increase of 47 percent in two years. Kerosene imports increased 20 percent to 35,000 barrels. Requirements for lighting were largely unchanged, but power kerosene imports were tripled in the two years. Another good indication of industrial recovery is seen in the lubricating oil imports which doubled between 1947 and 1949, rising from 28,000 to 54,000 barrels. Fuel oil and diesel oil enjoy a substantial market in the utility plants in New Guinea towns and for diesel power in tractors. Imports in 1947 were 570,000 barrels.

Vacuum Oil Company's new terminal at Lae was officially opened on July 8 by Col. J. K. Murray, administrator of Papua and New Guinea. More than 200 guests, including officials of the administration, leading aviation and shipping representatives and industrialists and businessmen from all parts of Papua and New Guinea were received by H. C. Smith, operations director for Vacuum, W. C. Fraser, Vacuum's Pacific Islands manager, and C. R. Heavy, manager in New Guinea for Vacuum.

Officially opening the Lae installation, Col. Murray said: "As you know, the Australian

Aerial view of the Lae bulk plant.



Entrance to the Vacuum Oil Company's new £150,000 bulk terminal at Lae.

government is greatly interested in the rapid development of this territory and is spending many millions of pounds to that end. As in other democracies, development here is dependent on a healthy, educated and technically competent people. We have an immense task in bringing about such conditions, but the Australian government is facing the post-war tasks with a resolution which is encouraging to all those who have the Commonwealth at heart.

"I know that the Vacuum Oil Company, with its worldwide interests, has an appreciation of the falsity of any suggestion that the skin color and brains are highly correlated and that it will afford to the native people of this territory an opportunity of becoming skilled persons in its employ."

Col. Murray expressed the hope that New Guinea will have its own source of crude oil within the next few years as a result of the activities of the Australasian Petroleum Co. in which Vacuum is a large shareholder. "I must express for the territory admiration of the work done by Vacuum Oil Co. in the planning and construction of this great project and congratulate the people of Lae on having such an asset to the territory as this bulk terminal," said Col. Murray.

Introducing Col. Murray, the Vacuum operations director, Mr. Smith, said the company had been marketing in the islands of the Pacific for about 40 years. However, with the exception of its premises at Port Moresby, the company's warehouses and plant in Papua and New Guinea had been destroyed during the war. In building the Lae depot, military tanks at Milne Bay had been purchased, dismantled and shipped to Lae with piping and other equipment to form the basis of the new terminal. Although this had proved costlier than purchase of new materials, it had enabled the terminal to be established at least three years earlier than if constructed of new materials and relieved the demand for steel and other essential materials so badly needed in New Guinea and Australia for the domestic housing program.

"By establishing this bulk terminal and other distributing points in Papua and New Guinea," said Mr. Smith, "the Vacuum Oil Co. is in a position to supply petroleum products to every form of mechanization needed for the development of the resources of Papua and New Guinea. For distribution in the Lae area and as far afield as Bulolo and Wau, the company is operating a fleet of road tankers which will be augmented as the demand increases. The availability of bulk distribution of aviation gasoline by modern methods and equipment is also provided for, and for distribution of products to outlying areas, two vessels, 'Viria' and 'Erica' will be used.

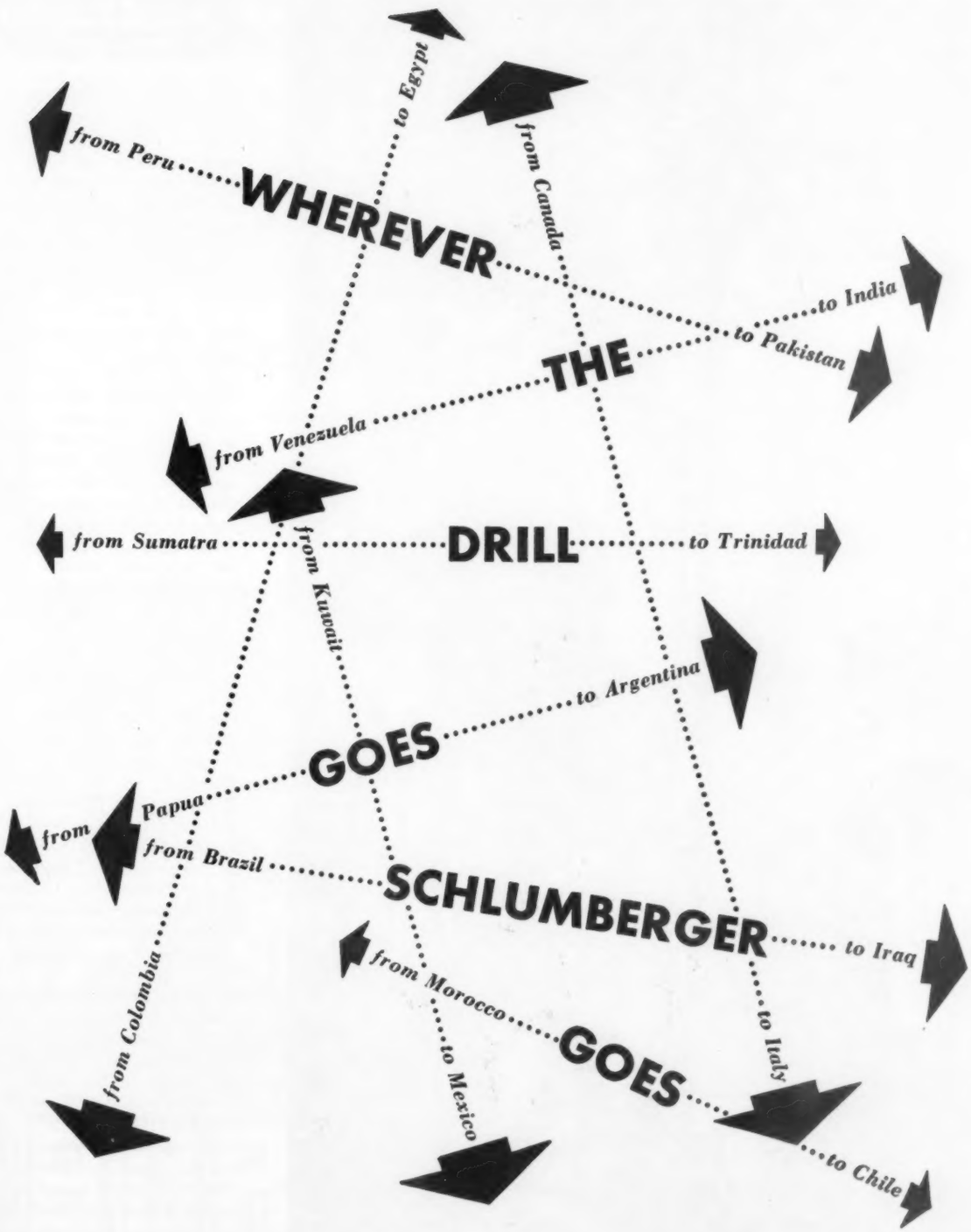
"Supplies of bulk products flowing into Lae terminal come from The Standard-Vacuum Oil Co. refinery at Palembang, in Sumatra, and much of the lubricating oil we are marketing in these territories is from our refinery at Altona, Victoria, which is processing crude oil produced in Western New Guinea," said Mr. Smith.

The new terminal at Lae has a capacity of 86,000 U. S. barrels of automotive and aviation gasoline, kerosene and automotive diesel oil stored in six 14,300-barrel tanks. It occupies an 11 acre site which includes warehouses, packaging plant, workshops, offices and residences. The staff numbers 70 Papuans and four Australians. The terminal will supply bulk and packaged products to a 400-mile radius, including Wewak, Madang, Samarai, Port Moresby, Rabaul (New Britain), Kavieng (New Ireland), and Manus Island in the Admiralty Group.

The first shipment to Lae was delivered by the chartered Norwegian tanker Lifjord which discharged more than 1,250,000 gallons in 46 hours with the help of inexperienced shore staff who patrolled the new pipelines and the rebuilt tanks all night in pouring rain to insure safety of the initial cargo. During the dark, wet patrol duty a New Guinea worker announced in Pidgin, "Come kwik time, big pella snake i stop," and an eight-foot python was killed along the pipeline.

Australian official photograph of buckets on the 3,000-ton gold mining dredge of Bulolo Gold Dredging, Ltd. All parts of the dredges were flown inland from Lae including the 118 buckets, each of which holds 10 cubic feet.

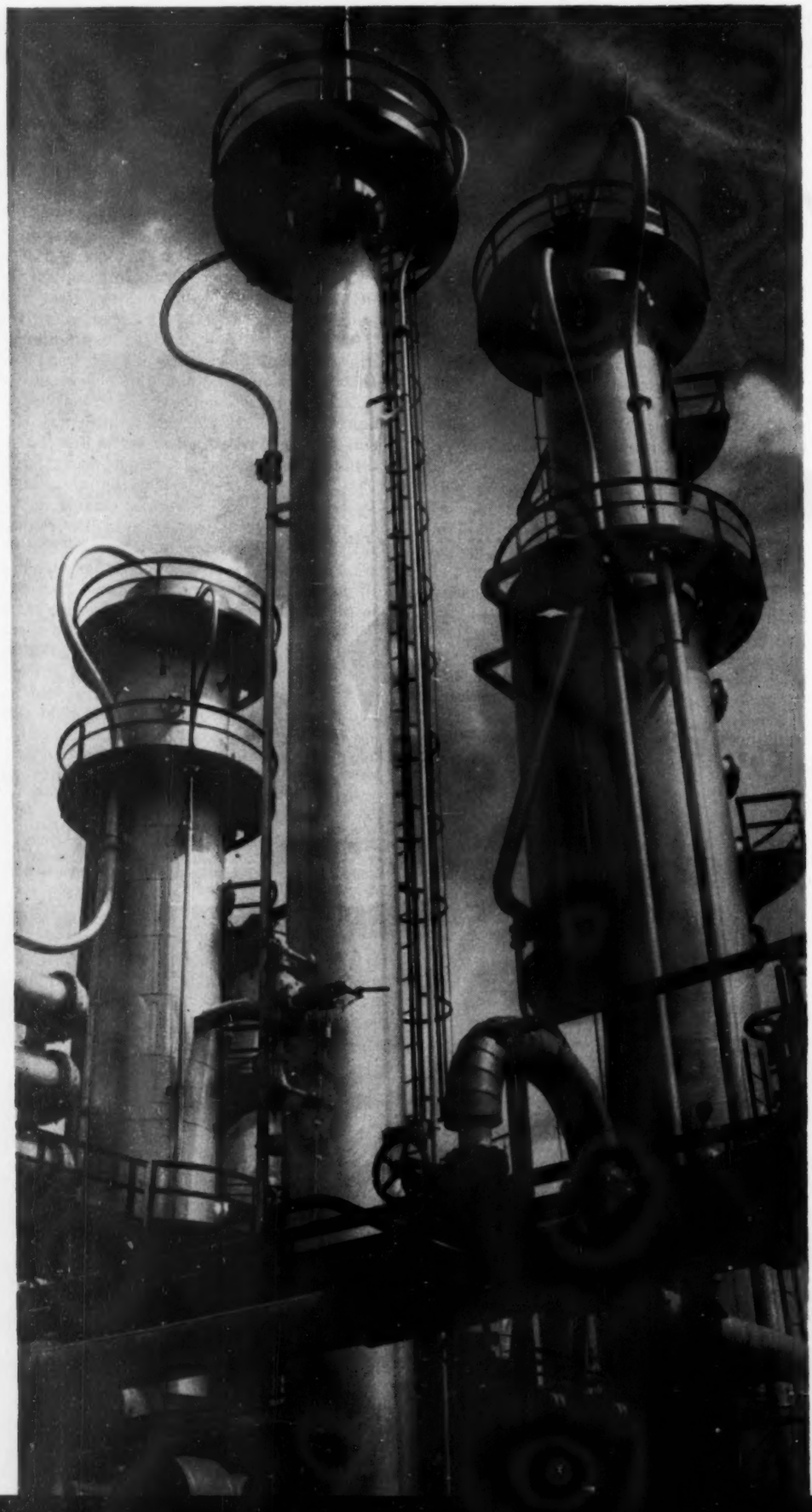
Roads are being built or repaired to permit a growing automotive movement in coastal New Guinea. Pictured is the truck used by Australian health service doctors and nurses to promote health in primitive villages. Photo by V. Gadsby for Australian Department of Information.


from Peru
WHEREVER
to Egypt
from Canada
to India
to Pakistan
THE
from Venezuela
from Sumatra
DRILL
to Trinidad
from Kuwait
to Argentina
GOES
from Papua
from Brazil
SCHLUMBERGER
to Iraq
from Colombia
from Morocco
GOES
to Mexico
to Italy
to Chile

German Oil Industry Makes Progress

By Alfred M. Stahmer

Fractionating columns at Olex (Anglo-Iranian) refinery at Hamburg-Finkenwerder. Olex photo.



CONSIDERABLE progress during the past twelve months can be reported from the German mineral oil industry both in crude production and refining. The outstanding achievements have been the development of some new fields, one of them possibly the forerunner of a further oil province in northwestern Germany halfway between the Ems border district and Hanover; the discovery of a new type of deposit in the old oil-producing area around Hanover; promising oil shows in southern Germany at the foot of the Alps; the exemption from dismantling of two big hydrogenation works which are now treating mineral oil; progress in rebuilding the refineries which were destroyed during the war and start of the erection of new cracking facilities approved by the OEEC. Crude output and refinery production have reached or are approaching all-time records.

In a previous report in WORLD PETROLEUM on German oil industries the newly-discovered Emsland fields, Ruehlertwist-Ruehlermoor, were described as a promising development. Though treated as separate discoveries, the two probably will be found to form one single field. They are situated near the Dutch border in a moor district. Since the discovery in May 1949, more than 20 wells have come in as relatively good producers with initial yields from 150 to 300 barrels daily. Production has been held below the existing potential, not only because of the difficult transport situation which will be relieved by completion of a pipeline now under construction, but also as a result of the policy adopted by the operators. These include C. Deilmann, Bergbau GmbH, Gewerkschaft Elwerath Preussag and Wintershall A.G. in Ruehlertwist and Deutsche Schachtbau-und Tiefbohr-GmbH., together with Gewerkschaft Elwerath in Ruehlermoor. They have been accumulating geological data to determine yields that will represent maximum economic recovery. The proved reserves of the fields have been estimated at six million tons; the probable reserves are set at 6.5 million tons. Thus Ruehlertwist-Ruehlermoor has the highest individual reserve figure of all German fields. Actual production in the month of August was 24,140 barrels in Ruehlermoor and 11,435 barrels in Ruehlertwist. A third new find in the Emsland is Scheerhorn, situated some miles northeast of the Georgsdorf field. The first well at Scheerhorn suggested a stratigraphic trap, but further drilling indicates that it is rather a prolongation of the Adorf anticline and that conditions are more complicated than had been anticipated. Several Scheerhorn wells have delivered water only.

In the oil district to the northeast of Hanover town, the discovery of oil bearing horizons connected with deep anticlines has created new interest in exploration of this area where heretofore salt dome fields only were known. In the new Suderbruch field near Steimbke, which is jointly owned by Gewerkschaft Brigitta (Shell and Esso Stand-

another important project

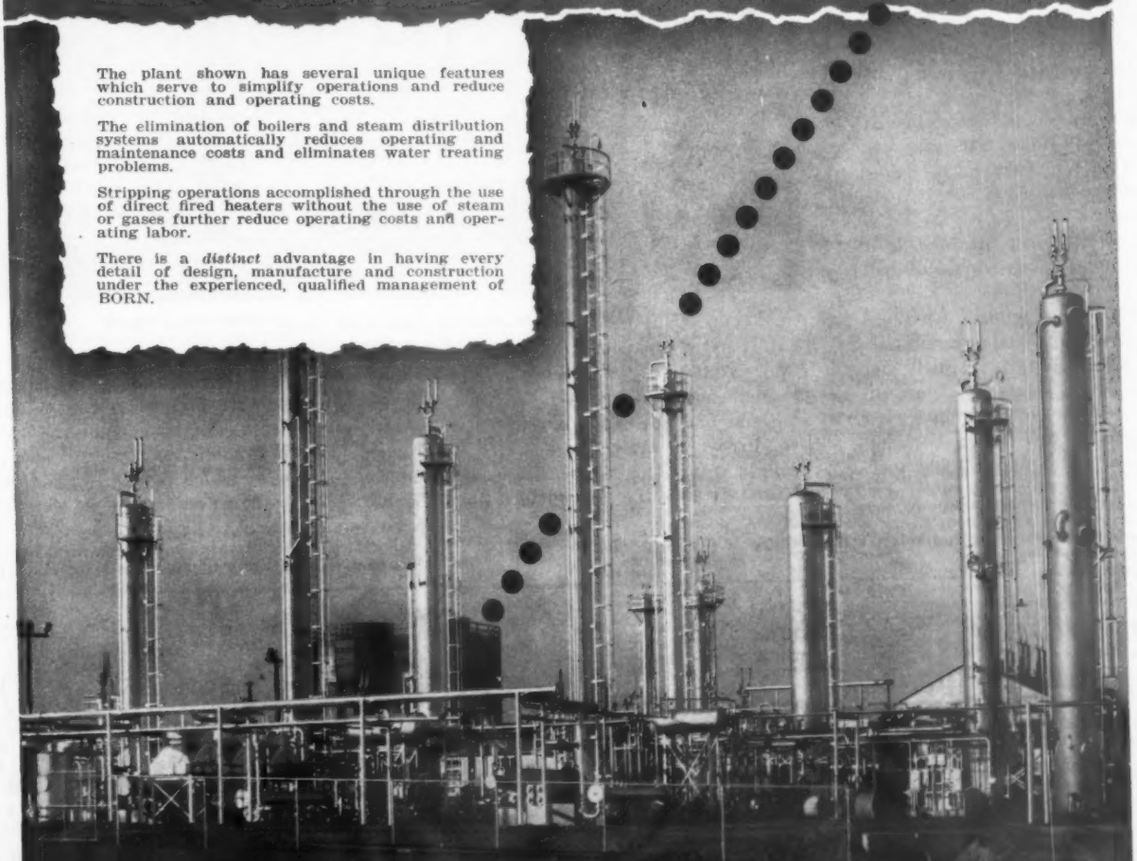
Designed AND Constructed BY BORN

The plant shown has several unique features which serve to simplify operations and reduce construction and operating costs.

The elimination of boilers and steam distribution systems automatically reduces operating and maintenance costs and eliminates water treating problems.

Stripping operations accomplished through the use of direct fired heaters without the use of steam or gases further reduce operating costs and operating labor.

There is a *distinct* advantage in having every detail of design, manufacture and construction under the experienced, qualified management of BORN.



When planning your next Refinery, Natural Gasoline Plant or direct fired Heater, call on BORN.

BORN Engineering Company

ENGINEERS and CONTRACTORS

TULSA, OKLAHOMA

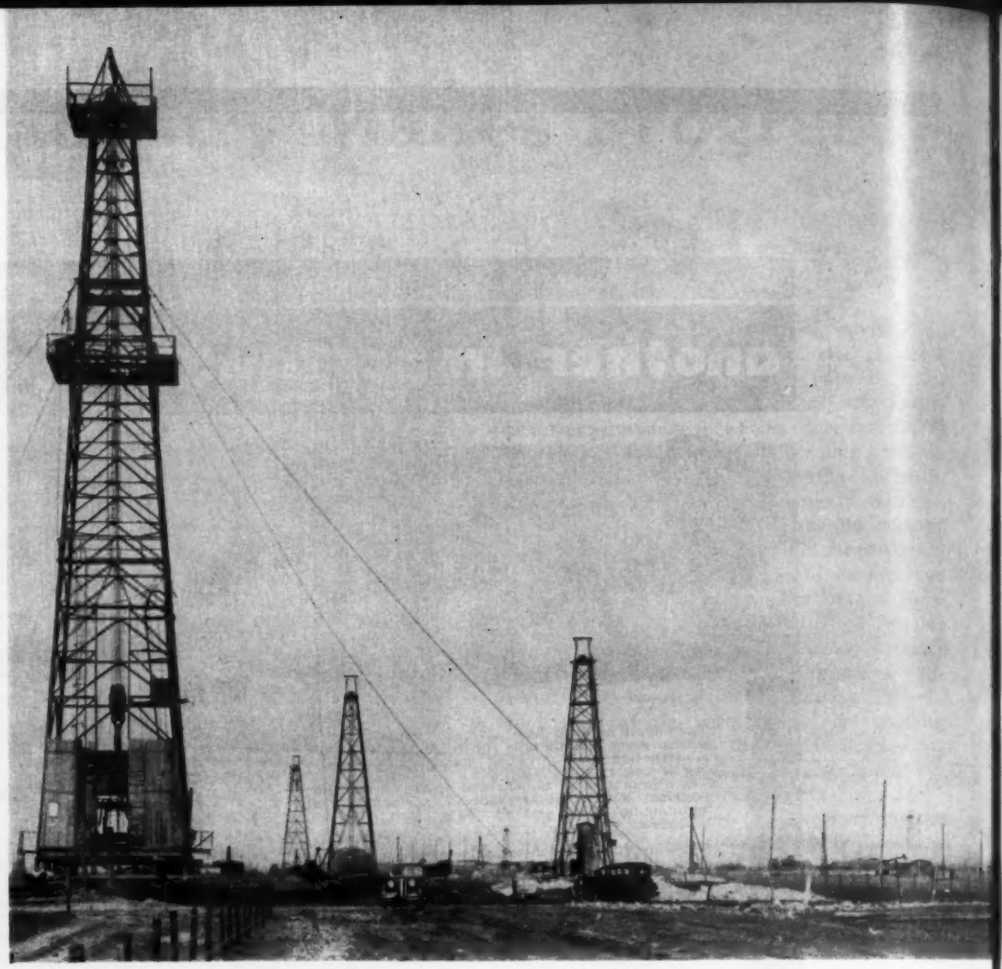
Representatives: LOS ANGELES, CALIF., G. R. Nance & Co. — SHREVEPORT, LA., Bass Sales & Equipment Co.
HOUSTON, TEXAS, Sales Engineering Co. of Houston, Inc. — NEW YORK, N. Y., Richard Morton

Canadian Associates: BRANDON, MANITOBA, Canadian Brown Steel Tank Co., Ltd.

ard) and Deutsche Vacuum Oel A.G. (Socony-Vacuum), half a dozen wells have come in as producers from the Cornbrash sandstone at depths from 6,700 to 6,800 feet. The German Geological Survey (Amt fuer Bodenforschung) estimated the proved reserves of the Suderbruch field at a million tons and the probable reserves at 2.5 million tons. The extension of the field is not yet defined. In Eldingen, northeast of Celle town, Gewerkschaft Elwerath discovered oil on a similar structure. Here the Liassic Angulaten sandstone appears to be heavily broken by faults. Some of the wells drilled soon went to water. Gewerkschaft Elwerath made a further find at Kuhlenberg on the Nienhagen-Haenigsen salt dome where the producing Wealden sand was met under a salt overburden.

In Schleswig-Holstein continued exploration of the elongated Heide structure by Deutsche Erdoel A.G. (DEA) has given good results. On the southern edge of the pool the new field Elpersbuettel was developed. Exploratory drilling on the deep western flank of the structure is under way with results yet to be determined.

In February 1950 the wildcat Quakenbrueck 5 (South Oldenburg) on a concession owned by Gewerkschaft Brigitta (Shell and Esso Standard) and Deutsche Vacuum (Socony-Vacuum) encountered crude with high paraffin content in the Lower Wealden (Cretaceous) at a depth of about 1,900 feet. The initial daily production was 45 cubic meters (285 barrels) through a ¼-inch choke. Quakenbrueck is situated halfway between Emsland and the Hanover oil district. Since the discovery seven more wells have been brought in. During the first six months of its existence the field yielded about 35,000 barrels. Production of this paraffinous crude is expensive because it can be maintained only by steam heating inside the wells. In August Wintershall A.G. found traces of oil, the cold test of which is even higher than that of the Quakenbrueck crude in the wildcat well St.



Rotary drilling rig in the Heide field. DEA photo.

Map showing location and relative importance of German fields.

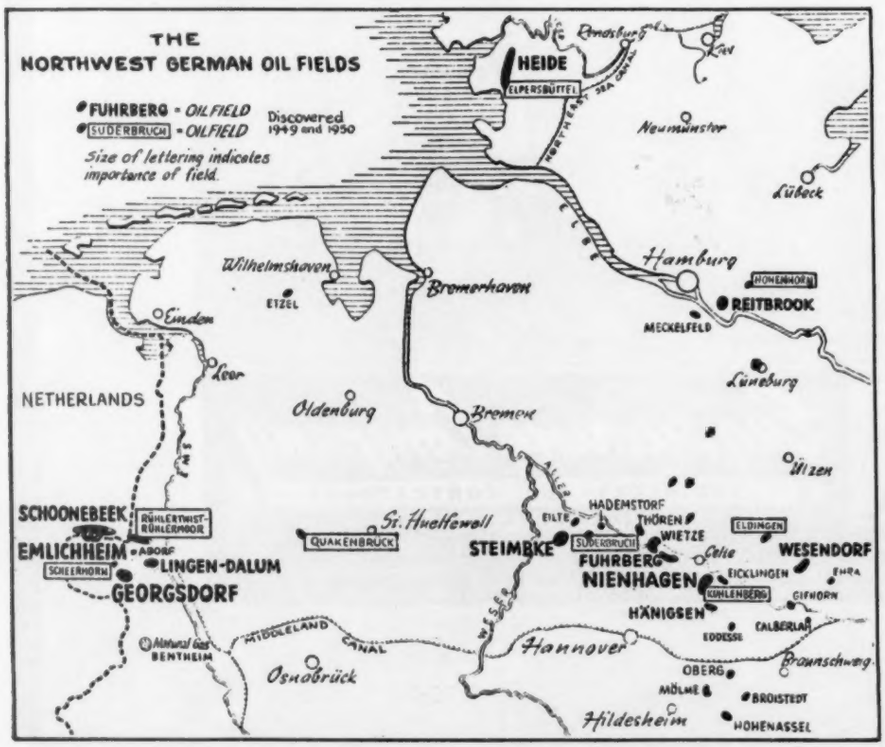
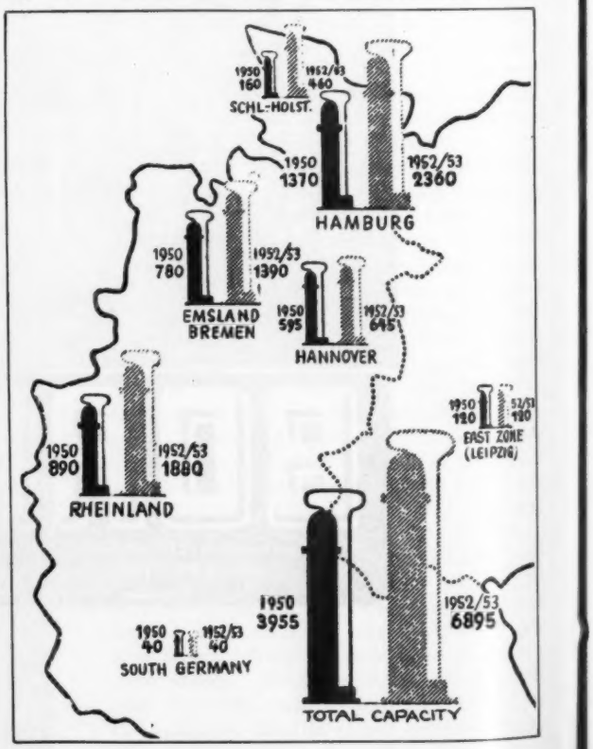


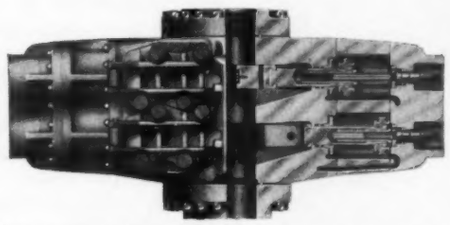
Chart showing location, current capacity and projected capacity in 1952-53 of German refineries (tons per year).



In cellar control gate equipment . . .

ONLY SHAFFER GIVES YOU BOTH

Hydraulic
OPERATION



Shaffer Hydraulic Cellar Control Gates

If your operations call for *hydraulically*-operated cellar control gates, the Shaffer Hydraulic Cellar Control Gate is, by all standards, the most advanced, most dependable, most compact hydraulic cellar control gate available today. These are only a few of its many outstanding advancements . . .

▸ **SPACE-SAVING COMPACTNESS:** In the Shaffer Hydraulic Cellar Control Gate you get TWO separate ram compartments unitized in ONE body—*with a total overall height of only 30" even in sizes as large as 13⅝" (12" Series 900)!*

▸ **COMPLETELY ENCLOSED DESIGN:** Note how all moving parts are completely enclosed within the gate body—nothing to become damaged or wedged by objects falling into the cellar—nothing to become corroded by chemicals or salt-laden muds. Even the locking shaft is non-rising—fully protected!

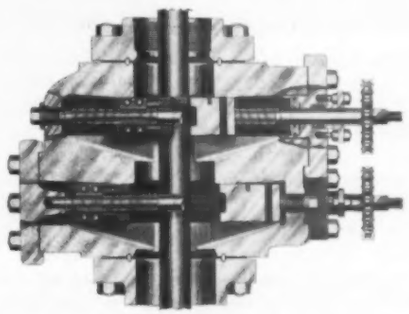
▸ **FAST, SIMPLE RAM CHANGES**—the simplest in *any* gate. Merely unbolt and swing open the side door, slide out the ram assembly, slide in the new assembly, close and bolt the door—and the job is done. *Moreover, complete ram changes can be made whether pipe is in or out of the hole!*

▸ **DIRECT HYDRAULIC DRIVE** with the hydraulic operating cylinders *directly behind* the rams. No secondary connections between hydraulic cylinders and rams—greater safety, maximum simplicity.

▸ **QUICK DRAINING BODY:** The rams travel on high narrow guide ribs far above the steeply-sloped compartment bottoms. Mud and sand quickly drain back into the well and no detrimental accumulations can collect to prevent free and complete ram travel!

The above advancements are vitally important—yet are only part of the COMPLETE *story on Shaffer Hydraulic Cellar Control Gates. Be sure to get* ALL *the facts from your Shaffer representative—or write direct!*

Mechanical
OPERATION



Shaffer Double Cellar Control Gates

If your operations call for *mechanically*-operated cellar control gates, the Shaffer Double Cellar Control Gate is unequalled in this field. Maximum compactness, rugged dependability and installation simplicity are assured by such exclusive features as these . . .

▸ **UNUSUAL COMPACTNESS:** Although Shaffer Double Cellar Control Gates combine TWO complete ram compartments in ONE compact body, *they require less than 29" of cellar height even for sizes as large as 13⅝" (12" Series 900)!*

▸ **WIDE CHOICE OF POWER:** Shaffer Double Cellar Control Gates can be readily operated with air, steam or electric drive—all with the added protection of complete manual standby. Moreover, the same gate can be quickly changed from one type of power to another to fit the requirements of different rigs.

▸ **SIMPLE RAM CHANGES:** Only *one* end cover need be removed to completely change the rams in the compartment of a Shaffer Double Cellar Control Gate. The complete ram assembly slides out in one unit, facilitating ram changes and eliminating extra operations.

▸ **SELF DRAINING BODY:** The compartment bottoms in Shaffer Double Cellar Control Gates feature the same quick draining design as Shaffer Hydraulic Cellar Control Gates. Rams travel on high narrow guide ribs where no detrimental sand or mud accumulations can collect to interfere with free ram travel. Any mud or sand that does get into the compartment quickly drains back out again into the well, reducing maintenance to a minimum.

There are many other important operating features built into Shaffer Double Cellar Control Gates and your Shaffer representative will be glad to give you the complete details.

HERE'S AN ADDED SAVING! Not only are Shaffer Cellar Control Gates—whether hydraulically or mechanically-operated—the most advanced in their respective fields, but if you use *both* types in your field operations there is no need to stock separate ram blocks and ram rubbers for each type of gate. Ram Rubbers and Ram Blocks are interchangeable, size for size, between the hydraulically-operated and mechanically-operated Shaffer Cellar Control Gates. You save on inventory, minimize delays, simplify shipping and stock-room requirements.

SHAFFER

27 years OF OIL TOOL LEADERSHIP

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

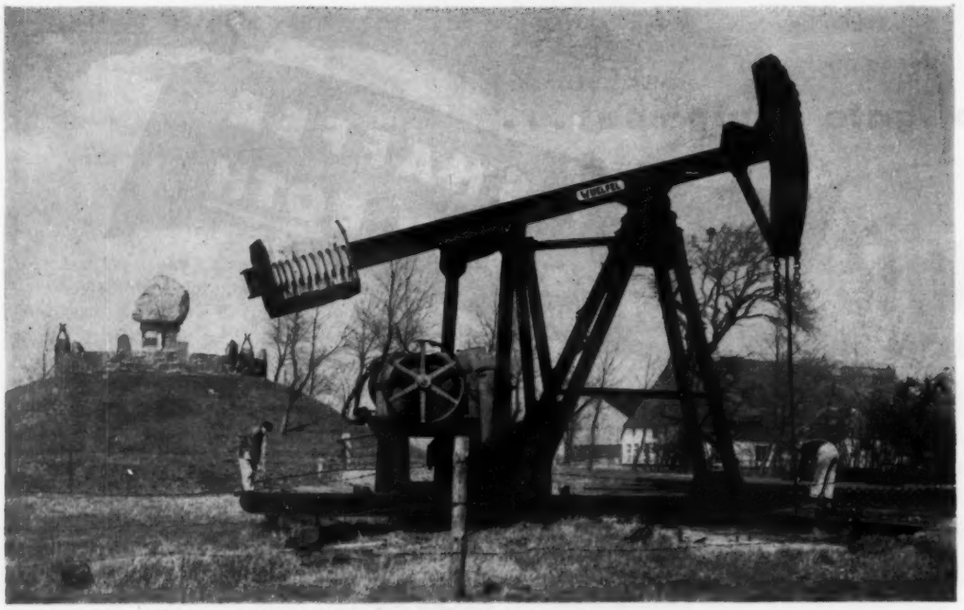
SHAFFER TOOL WORKS, Brea, California • California Service Shops: Santa Fe Springs and Taft
HOUSTON, TEXAS, 6006 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Acme Oil Tool Company, 1001 S. E. 29th Street
CASPER, WYOMING, Shaffer Tool Works, Post Office Box 1788
EXPORT SALES OFFICE: Shaffer Tool Works, 500 Fifth Avenue, New York, N. Y., U.S.A.

Get an unbiased recommendation

on the type of cellar control gate best suited to *your* operations. Since Shaffer—and *only* Shaffer—manufactures both *hydraulically*-operated and *mechanically*-operated cellar control gates, Shaffer alone can provide you with either type of gate—depending upon which is best for *your particular* operations!

See pages 4433 to 4496 of your 1950 Composite Catalog for helpful data on the above equipment as well as on other Shaffer products.

Write for your free copy of the new Shaffer Catalog.



Pumping well in Heide field. In background is war memorial to a battle between knights and peasants in the middle ages.

Huelfe 1, about eighteen miles east of Quakenbrueck. Further wells are to clarify the situation. There seems to be no doubt that there are good oil prospects in the district between the rivers Ems and Weser. The question is, however, whether, in view of the high cold test, the deposits can be exploited economically or whether deeper horizons may produce another type of crude.

After granting of concessions by the government, the oil companies have started investigations and core drilling in the foreland of the Bavarian Alps in the American and French zones of Germany. Exploration in Bavaria and Swabia is encouraged by successful development in the Vienna basin which geologically forms part of the foreland region north of the Alps. In former years the Bayerische Mineral-Industrie A.G., a subsidiary of Socony-Vacuum Oil Co., and Deutsche Erdoel A.G. (DEA) carried out a certain amount of deep drilling. The wildcatting which now has been undertaken was stimulated by recent oil finds in shallow holes at Ehingen near the Danube river in South Wuertemberg. In the district of Ehingen outcrops of asphaltic-impregnated sands of the Suesswassermolasse were previously known. In three core holes of Itag the chalks of the Lower Suesswassermolasse formation reveal good oil impregnation. Traces of a heavy asphaltic crude were also encountered in the Jurassic below. The location of the wells is on the northern edge of the Molasse basin. A deep well of Gewerkschaft Elwerath, which is to be sunk further to the south near Biberach, is to test the deeper parts of the basin in which, after the results of the Ehingen wells, considerable quantities of oil may be found. Whether the crude has accumulated at some places in economic quantities can only be determined by further wildcatting.

Crude wildcatting in western Germany in 1949 amounted to 841,576 tons or an average of 16,835 barrels daily. In August 1950 the output was 98,800 tons or 23,265 barrels daily. In 1949 the largest production was from the Hanover fields, but within the past few months the Emsland district has moved up to first position.

Drilling activities have increased greatly during the past two years. The total of 981,000 feet in 1949 established an all-time record. The program for 1950 aimed at a total footage of 1.5 million feet, a considerable part being exploration and extension wells. While this target may not be reached this year, it is clear that a new record will be established.

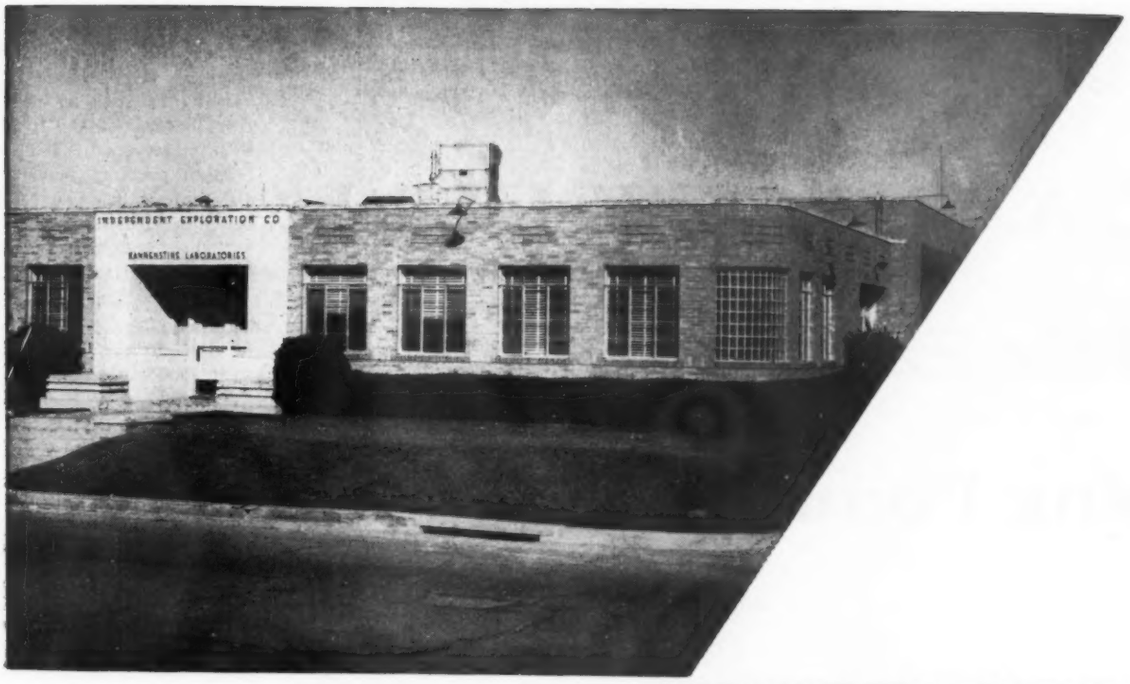
The German body for refinery planning, the Arbeitsgemeinschaft Erdoel-Gewinnung und Versarbeitung (AEV), recently published the program for the western German refining industry for the fiscal year 1950-51 which provides for a total throughput of 4,226,000 tons or 84,500 barrels daily. This is 88 percent more than the amount of crude treated during the fiscal year 1949-50 (2,248,240 tons). In addition to the anticipated German crude output of 1,250,000 tons, 2,566,000 tons of Arabian and 410,000 tons of Venezuelan crude or, in the case of Venezuela, a small amount of topping residues, are to be imported under this program. The total output from these quantities is expected to be about 3,981,700 tons of finished products including 1,253,500 tons motor gasoline, 1,034,500 tons diesel oil, 508,700 tons fuel oil (mainly for bunkering purposes), 382,600 tons bitumen and 363,000 tons lube oil. Except for relatively small quantities of motor gasoline and bitumen and about 270,000 tons diesel oil, the anticipated refinery output during the fiscal year 1950-51 will suffice to meet the local demand which, as regards motor gasoline, is still restricted.

The plan means a large increase as compared to the refinery production figures for the years since the capitulation and even for the years before the war. It can be fulfilled only with the help of the two hydrogenation plants Wesseling and Gelsenberg and after rebuilding and extension of the normal refineries. Both Wesseling and Gelsenberg have now received new and higher production permits for the turnout of 30,000 tons hydrogenation products per month. In these works the yield from the treatment of German crude averages six per cent topping gasoline, 57 percent hydrogenation gasoline, eight percent liquid gas and 18 percent diesel oil. Previous reports have described the reconstruction and extension of the refineries of Esso and Shell in Hamburg-Harburg. In the meantime Oelwerke Julius Schindler GmbH, Hamburg-Wilhelmsburg, hitherto only lube refiners, have erected a topping unit with a capacity of 120,000 tons per year. In September the Olex (Anglo-Iranian) refinery, formerly Eurotank, in Hamburg-Finkenwerder officially began operations in its rebuilt Winkler-Koch cracking plant. The total intake capacity of the Olex refinery is now 600,000 tons yearly. In January next another opening will take place at Ostermoor on the Kiel Canal where the war-damaged plant of Mineraloel and Asphaltwerke A.G. (MAWAG), which specializes in bitumen production, will treat 60,000 tons of Venezuelan crude per year.

Interest of the refining industry is centered upon the erection of new cracking facilities which are to satisfy the growing demand for more gasoline in Germany and, on the other hand, to utilize the residues for which, if used as fuel oil, there exists no market in the country.

The OEEC in Paris has approved German plans for the erection of additional cracking units with a capacity of over a million tons per annum. The biggest project is that of Gewerkschaft Erdoel-Raffinerie Emsland at Lingen in which the principal producing companies in the Emsland participate. Near the town of Lingen on the River Ems work has been started on the construction of a new refinery with a yearly throughput capacity of 600,000 tons crude. As the Emsland crude gives a high percentage of residue, the cracking capacity amounts to 400,000 tons. At the hydrogenation plant Wesseling, which is closely connected with Shell, a cracking unit is to be erected with a capacity of 325,000 tons yearly. After completion of this project Wesseling will treat the crude in three stages: (1) topping, (2) cracking of residues, and (3) hydrogenation of cracking residues. A third project is that of Deutsche Vacuum Oel A.G. (Socony-Vacuum) in its refinery at Bremen-Oslebshausen where the distillation units have been considerably extended. Bremen-Oslebshausen is to crack 160,000 tons per year. Deutsche Erdoel A.G. (DEA) has begun the enlargement of its plant at Heide. The aim is a yearly crude intake of 400,000 tons and additional cracking capacity of 150,000 tons. Finally Ruhrchemie A.G., Oberhausen-Holten, together with Hamburger Mineraloel-Werke Ernst Jung and Omnipetrol GmbH, will reactivate its war-damaged cracking unit of 65,000 tons per year. After the end of the Marshall Plan, a 400,000-ton cracking plant of the German Esso Organization is to be added to the Esso refinery at Hamburg-Harburg.

All in all, it may be assumed that, if peace is maintained in Europe, western Germany will soon to be in a position to meet all requirements for mineral oil from its own refinery output, even when restrictions on the use of gasoline are lifted and consumption reaches the level of the neighboring countries in western Europe.



EXPERIENCE IN FOREIGN FIELDS

. . . . . pays off in profitable results when you contract with Independent

The success of almost any survey project in a foreign country depends on overcoming the varied special problems often encountered. Since 1932 Independent has had crews abroad almost continuously, and has accumulated many crew-years of seismic survey experience in foreign fields.

The men who directed this work are at your service now to aid in planning your exploration program in any part of the world. Their experience and the record of results are your assurance of satisfactory returns on your investment.

You are cordially invited to consult with us about your plans.

Independent
EXPLORATION COMPANY
Geophysical Surveys

ESPERSON BUILDING HOUSTON, TEXAS

E. C. A. Seeks to Establish Middle East As Basing Point

THE Economic Cooperation Administration has recently issued an amendment to its regulations which will have a profound effect on the flow of ECA-financed petroleum products to Marshall Plan countries. As promulgated by William Foster, who is now administrator, the new rule requires oil companies shipping from the Middle East to reduce their prices to a level substantially below those now prevailing in United States markets. The ruling was first proposed to become effective on Sept. 15, but later was postponed until Oct. 1.

First effect of the ruling which seems most likely at this moment is to create an artificial barrier which will prevent the flow of Middle East oil products produced by United States companies to countries which have been buying ECA-financed oil. Instead, in a firm world market the oil for such consumers might have to come from other sources, such as British refineries and be ineligible for ECA-financing. California-Texas Oil Co. announced promptly that it would cease selling Bahrein oil to ECA-financed accounts. The company said it was placed at an unfair disadvantage. Standard Oil Co. (N.J.) had made no announcement as to its future policy at the time this was written, but Jersey officials have spent a good deal of time in Washington lately presenting their views on the matter. That company is said to have no immediate ECA cargo lifting from the Persian Gulf in prospect. Caltex has no crude oil resources in production outside of the Persian Gulf but companies such as the Jersey Standard with alternate sources of supply also would be prevented by ECA from shipping products to ECA-financed accounts in the Mediterranean at U.S. prices plus freight from the U.S. Gulf. If they wish to sell in this area the price now will have to be based on the Persian Gulf less the $3.50 arbitrary demanded by ECA.

The ruling which is reproduced on page 74 ostensibly seeks to establish the Persian Gulf as a price-basing point similar to the United States Gulf market. While directed at a small segment of the world industry, it could, in fact, have a profound influence on the flow of world trade. It might, if literally applied and enforced by ECA, make it impossible for certain countries to receive any ECA-financed petroleum at all.

Legal departments of the oil companies express doubts that Congress intended ECA to attempt control of prices. It is clear, however, that the regulation does put ECA into the price control business. Following a step further in this direction, the administration has moved to limit tanker rates on ECA shipments to not more than five percent above the old U. S. Maritime Commission level. Open market charters recently have been as much as 50 percent above USMC because of the active demand for tankers. Assuming that shippers do not have available ships, the newest rule would require suppliers of ECA-financed oil to absorb the higher freight rates now in effect.

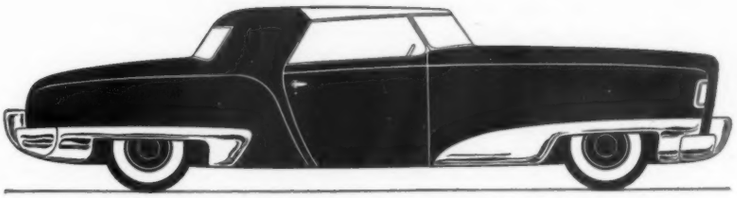
Analysis of the new Amendment 5 suggests that it could if allowed to stand, have far-reaching price control effects upon petroleum refiners, large and small, in the United States as well as elsewhere throughout the world. It goes beyond any OPA regulations promulgated during World War II in requiring prices to be fixed below lowest competitive levels in other markets.

Paragraph A of the amendment denies ECA financing for any importation of petroleum products by a participating country, unless the delivered cost is as low as that from any available alternative source of supply, including the Middle East at the lower prices fixed by ECA for delivery in the Mediterranean. Paragraph B denies ECA financing for any petroleum product import from a source other than the United States unless the f.o.b. price does not exceed the lowest competitive market price in the United States. Paragraph B further provides that if the "source other than the United States" happens to be a source in the Middle East, ECA financing will be denied unless the f.o.b. price charged is less than the lowest competitive market price in the United States by an amount varying from $3.50 per ton (on shipments from Bahrein Island to Mediterranean ports) to a maximum of $5.55 on shipments from Iranian ports to Norway. These arbitrary differentials bear no relation to the product being carried, nor do they correspond to established freight rates except coincidentally for some destinations.

Under former pricing policies Persian Gulf suppliers absorbed part of the freight to destinations west of Malta to compete with Caribbean suppliers. Delivered prices were equal to U.S. Gulf plus freight from that source to destination. At Malta the two markets were about equal, freight considered. East of Malta the practice was to charge U.S. Gulf prices plus actual freight from the Persian Gulf. The ECA rule would require Middle East refiners to reduce their prices to Mediterranean destinations by the amount of the USMC freight differentials between the Caribbean and the Persian Gulf at Gibraltar, not at the actual destination. It thus outlaws variable absorption based on distance within the Mediterranean.

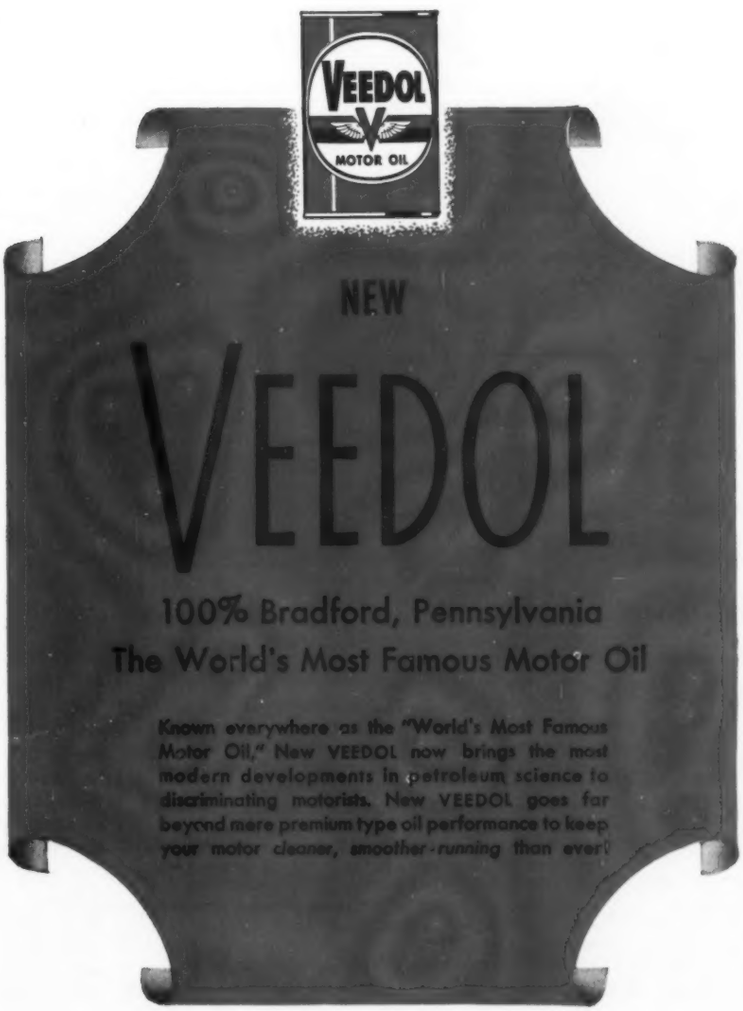
While ECA probably did not intend to deny petroleum refiners in the United States the right to ship their products to participating countries under ECA financing, this is one effect of the new regulation as written. As long as f.o.b. prices in the U. S. Gulf and in the Caribbean are the same, Caribbean products will always enjoy a delivered cost advantage over U. S. products, anywhere in Europe, since freight charges are less from the Caribbean than from the U. S. Gulf. Since Paragraph A of the regulation requires "lowest prevailing delivered cost," United States producers, be they large or small, independent or major, are barred from ECA-financed sales in the European market.

Instead of increasing competition in the marketing of petroleum, the ECA regulation destroys it. Suppose, for example, that a Middle East producer should acquiesce to ECA's price regulation and offer to supply products in Italy at a price f.o.b. the Persian Gulf at $3.50 below the *Platt's Oilgram* low in the United States. If a Western Hemisphere producer wishes to sell the same product in Italy, he must, under Paragraph A of the new regulation, meet the new lower delivered price. At freights equal to USMC flat rates, a Caribbean producer would find his former advantage of $1.10 per long ton to Naples converted to a disadvantage of $2.40 per long ton. The Western Hemisphere supplier must then make a concession of $2.40 per ton if his shipment to Italy is to qualify for ECA financing. However, should the low of Platt's decline $2.40 per ton as a result of this concession, this would mean that the Persian Gulf producer must now quote (in order to qualify his shipment for ECA financing) a price not $3.50 but $5.90 below the original level of the U. S. Gulf quo-



Sports Coupe by Gustav Jensen, Designer to Commerce and Industry, New York

Found
Wherever Fine Cars
Travel


VEEDOL
MOTOR OIL
NEW
VEEDOL
100% Bradford, Pennsylvania
The World's Most Famous Motor Oil
Known everywhere as the "World's Most Famous Motor Oil," New VEEDOL now brings the most modern developments in petroleum science to discriminating motorists. New VEEDOL goes far beyond mere premium type oil performance to keep your motor cleaner, smoother-running than ever!

TIDE WATER ASSOCIATED OIL COMPANY
NEW YORK · TULSA · SAN FRANCISCO

tations. This process could, of course, continue until one producing source abandoned the market entirely, thus completely destroying regional competition.

It should not be supposed, however, that the new ECA regulation prohibits all freight absorption. In fact, it both prohibits and, at the same time, requires freight absorption. On sales from the Middle East to destinations in the Mediterranean, the new Amendment 5 does require a uniform "net-back"; that is to say, no freight absorption within this area is permitted for ECA-financed shipments. However, once a Middle East cargo passes Gibraltar the "ground rules" are entirely changed and freight absorption becomes compulsory. Paragraph B of the regulation stipulates that the Middle East net-back which is eligible for financing at Gibraltar must be reduced by another 85 cents on shipments to the United Kingdom, by a still further 30 cents on shipments to Sweden, and by another 20 cents on shipments to Norway. ECA has not stated on what grounds it finds freight absorption evil in the Mediterranean and necessary in northwest Europe.

American producers around the world feel that they have sufficient difficulty in competing with the British because of the world-wide scarcity of dollars and the much greater availability of pounds sterling. The American companies have had to make concessions in their marketing arrangements and in their opportunities for profit in order to overcome the competitive disadvantage in which they were placed by the combination of dollar shortages and British currency controls. ECA has no means of restricting sales by British companies in the Middle East or anywhere else, and, accordingly, the British competitors can continue to supply European markets and at much higher prices with American competition removed than might otherwise be the case. While ECA does not issue procurement authorizations for the purchase with ECA dollars of British petroleum in the Middle East, the net effect is the same. Through the European Payments Union, ECA is financing with American taxpayers' dollars the convertibility of the several European currencies, one with another. The Greeks, for example, would be no better able to pay pounds sterling for British oil than to pay dollars for American oil, were it not for ECA.

British observers appear to find the new ECA regulation puzzling. On Sept. 23, 1950, the *"London Economist"* declared: "It appears at first glance that ECA has abandoned its customary discretion. . . . The effect of the regulations is to introduce fixed and arbitrary rebates on the prices of Middle East oil." And further, "It seems doubtful whether the new ECA regulations will work. . . . This attempt to force prices down goes against the tendency of world markets."

World market observers believe that the rigidity which Amendment 5 forces upon international petroleum movements must inevitably mean higher costs to both producers and consumers. The period of adjustment during which the ECA countries must accommodate themselves to the limitations imposed upon their petroleum consumption pattern by the new ECA regulation, if it is allowed to stand, will certainly be a difficult one.

TEXT OF ECONOMIC COOPERATION ADMINISTRATION RULING

Amendment 5 to ECA Regulation 1 (F. R. Doc. 50-7387, 15 F. R. 5690) is amended to read as follows:

ECA Regulation 1 is amended in the following respect:

Section 201.22 (d) (4) is amended by adding the following:

(i) Petroleum Products. (a) Purchases from any source: A price for a purchase of a petroleum product from any source will not be approved for reimbursement if it results in a delivered cost to the participating country which is in excess of the lowest prevailing delivered cost, on the date the purchase price is fixed, for a comparable export sale of the same or similar commodity to such participating country from any alternative source of supply from which the commodity is available for export in sufficient quantity.

(b) Purchases from sources other than the United States: A price for a purchase of a petroleum product from sources other than the United States will be approved for reimbursement if it complies with the requirements of paragraph (e) (2) of this section, and does not exceed the lowest competitive market price in the United States for a comparable export sale of the same or a similar commodity on the date the purchase price is fixed.

Provided, That a price for a purchase of a petroleum product from the Middle East may not exceed the United States price referred to above less $3.50 per long ton for loadings from Arabian ports or from Bahrein Island; $4.00 per long ton for loadings from Kuwait ports; or $4.20 per long ton for loadings from Iranian ports; Provided further, That the price shall be further reduced in the amounts specified below for shipments to the following destinations:

Group	Ports of Destination	Additional Reductions per long ton
1	Including and between Bordeaux, Hamburg and United Kingdom	$0.85
2	Sweden	1.15
3	Denmark	1.25
4	Norway	1.35

(c) for the purposes of this subdivision, a sale for export from the Middle East to any port of destination described in subdivision (b) of this subdivision shall not be deemed a "comparable sale" within the meaning of paragraph (b) (2) of this section to (1) a sale for export from the Middle East to any other port of destination in any other group described in subdivision (b) of this subdivision, or (2) any other destination other than the United States.

(d) For purposes of this subdivision "price" shall mean the realized f.o.b. price or realized netback.

Transitory provision. This amendment to ECA Regulation 1 will take effect on October 1, 1950, but will not be applicable to claims for reimbursement for payments made to a supplier pursuant to letters of credit issued, confirmed or advised, or payment instructions received, prior to Septem 15, 1950.

(Sec. 104, 62 Stat. 138, as amended; 22 U.S.C. Sup., 1503. Interprets or applies secs. 111, 403, 62 Stat. 143, 159; 22 U.S.C. Sup., 1509, 1542)

WILLIAM FOSTER
Acting Administrator for Economic Cooperation

(F. R. Doc. 50-8434; Filed, Sept. 26, 1950; 8:49 am)

The Petroleum Industry in Relation to National Defense

(Continued from page 59)

of pressure tankcars. Our refining situation nominally looks fair, with a little more than 10 percent leeway, although personally I do not feel that 10 percent is an adequate cushion in a vital branch of an industry as important to war as oil. Furthermore, we all know that in any refinery the percent of capacity which is idle is the least efficient portion, and so in all fairness our true surplus is probably something less than 10 percent.

Despite the almost complete adoption of the 115/145 grade for military planes and the need for almost pure alkylate to make it, our industry has not only not built any new alkylation units since the war, but has actually dismantled or converted some that were in use on V-J Day.

Should military requirements shift to jet fuels in substantial amounts, existing refinery gas plant facilities might be found entirely inadequate to meet all-out war requirements.

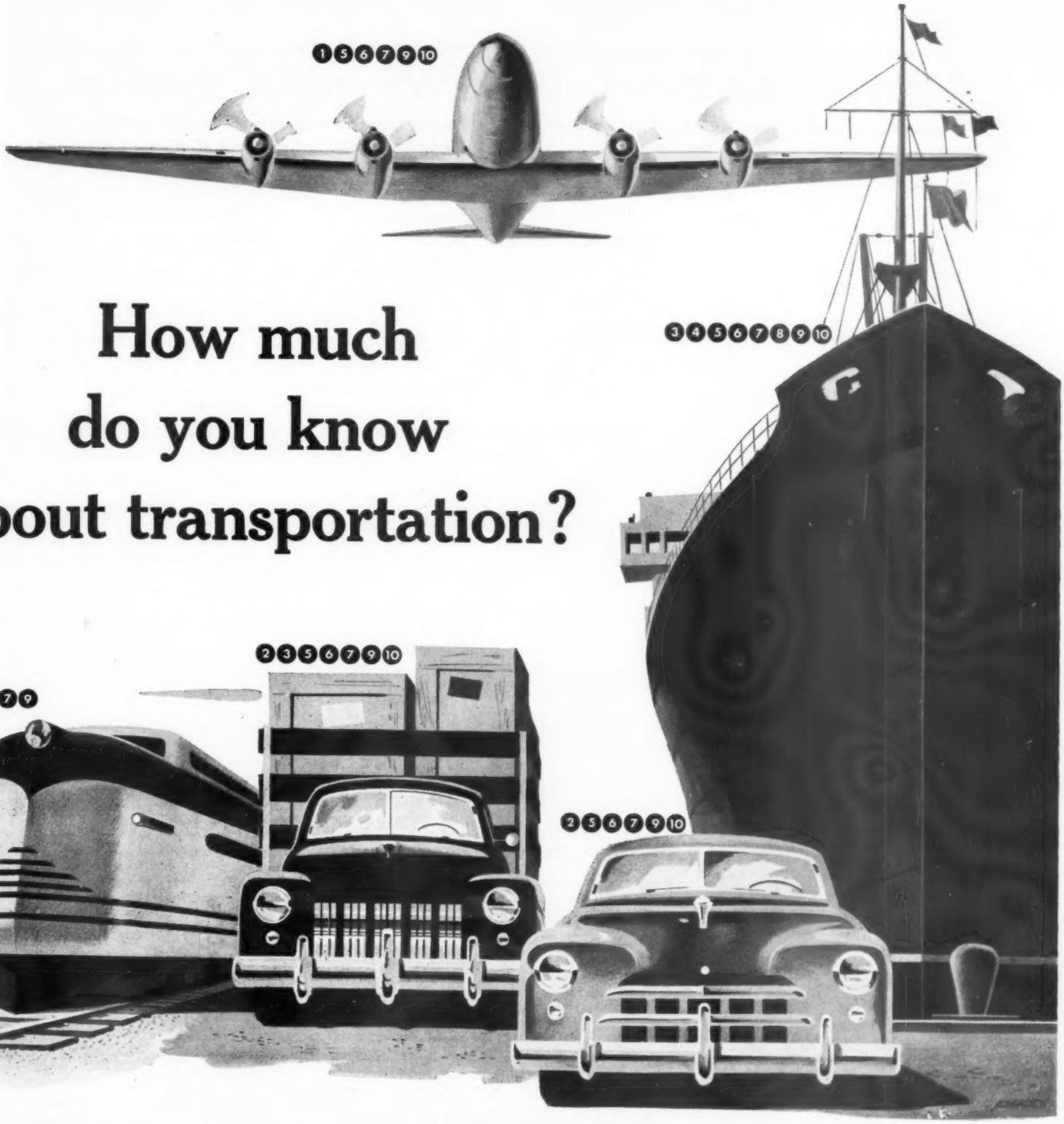
There are other phases of our industry where adherence to the economic stimuli of peace might leave us short in time of war, but the examples cited should suffice for this discussion.

What all this means is that, left to itself, a highly competitive industry such as ours will develop according to the pressures currently upon it, and only to those pressures. No company can afford to do otherwise. There is no extra money from earnings or any other source to permit the construction of a stand-by capacity that would not be needed until the next war and might be obsolete then. Neither are there any surplus funds to pay for equipment to make specialized products for which there is no peacetime demand.

Thus the question arises whether, in the light of all circumstances and particularly the technology of modern war with its attendant supply problems, the oil industry can be expected to be always ready to meet any conceivable wartime demands if it is to continue to rely for its development solely on the economics of peace.

I yield to nobody in my aversion to government activity in business, whether by controls, subsidies, price supports or anything else. And yet somehow the problem must be solved. It is not easy to devise means by which the building and maintenance of specialized plant, necessary for war but useless or at least inefficient in peace, can be financed. I believe and hope that there is enough ingenuity among us so that, assuming good will on both sides, appropriate arrangements can be devised.

This article is a condensation of an address by Mr. Jennings before a meeting of the Texas Mid-Continent Oil and Gas Association at Dallas, October 5, 1950.—Editor.



How much do you know about transportation?

Nearly all of the rapid, modern transportation by land, sea and air depends on petroleum for power and lubrication. But few realize the wide variety of petroleum products required to keep travel and trade in motion. Test your own knowledge.

At right are listed a few of the many petroleum products needed. See how many of them you can correctly identify with the mode of transportation in which they are used. Then check your estimates with the figures in the illustration.

Through research and service, we are helping in the progress of transportation and providing the quality petroleum products required for the airways, the seaways and the highways. *Petroleum helps to build a better life.*

1. Aviation Gasoline
2. Automotive Gasolines
3. Diesel Fuel
4. Bunker Fuel Oils
5. Lubricating Greases
6. Heavy Duty Motor and Engine Oils
7. Synthetic Rubber
8. Steam Turbine Oils
9. Gear Lubricants
10. Hydraulic Oils

The better you live,
the more oil you use...

STANDARD OIL COMPANY
(NEW JERSEY)

International news and notes

South American Petroleum Congress

Plans for the first South American Petroleum Congress are being developed by the Uruguay section of the South American Petroleum Institute at the invitation of the international permanent council of the Institute. The meetings will be held at Montevideo from March 12 to 16, 1951.

Objects of the meeting as stated by the council include: (1) studies of methods for increasing production of crude and products in Latin America; (2) methods of obtaining maximum economic recoveries; (3) increasing international oil trade in South America; and (4) stimulating the friendly interchange of ideas among members of the industry.

Chairman of the Congress committee in Uruguay is Carlos R. Végh Garzón, secretary is Germán E. Villar, and treasurer, Col. Tydeo Larre Borges. Other members are Salvador Masson and Ernesto Pelufo. Committee headquarters are at Avenida Agraciada 1464, Montevideo.

Charles R. Dodson

Dodson Joins International Consultants

Charles R. Dodson, professor of petroleum engineering and chairman of that division in the College of Engineering of the University of Southern California since 1948, has joined the staff of International Petroleum Consultants, Inc., Pasadena. Mr. Dodson was with Standard Oil Co. of California for 11 years prior to 1948, during which he served as head of the production research department for six years. While with the university he has served as consultant for a number of companies. He will engage in general petroleum engineering work for IPC and will advise the affiliated organizations, Petroleum Engineering Associates, Oil Properties Petroleum Industry Consultants S.A., and Geological Consultants.

Organizer of the group of companies is Florent H. Bailly, who was elected president of Pantepec Oil Co. of Venezuela and Pancoastal Oil Co. in 1949 after 20 years with the former company as geologist and chief engineer. His principal associates in the group are John F. Dodge, petroleum engineer; Rene Engel, geologist and chemical engineer; and Hans Talman, geologist, stratigrapher and micropaleontologist, who has worked in the fields of Oceania and Latin America for many years with affiliates of Standard Oil Co. (N.J.). James B. Christie, engineer and lawyer, has been retained by the group.

British Surveyor Launched

Harland & Wolff Ltd. has launched the motor-driven oil tanker "British Surveyor", the last of a group of three 12,000-ton tankers built at Belfast for the British Tanker Co. Ltd. The new tanker will join her sister ship "British Prospector" at the fitting-out wharves. The first ship of the group "British Explorer" was completed early in July and is now in service. A large single screw turbine-driven tanker of 28,000 tons deadweight for the same owners has yet to be laid down at Belfast.

Middleton to Manage Stanlow Refinery

C. R. Middleton has been appointed refinery manager at Stanlow, in place of F. Mackley, who has been transferred to the head office of "Shell" Refining and Marketing Company as assistant general manager. Mr. Middleton joined Shell-Mex Ltd. in 1925. From 1927 to 1938 he was at the Suez refinery of Anglo-Egyptian Oilfields Ltd., where he advanced to refinery manager. He returned to Europe in 1938 to occupy several positions before going to Trinidad in 1940, after the fall of France, as manager of the UBOT refinery. In 1946 he was appointed assistant general manager of Sarawak Oilfields Ltd., which post he held until his present appointment.

Mr. Middleton was awarded the George Medal for "bravery and resource" displayed during enemy air raids on Shell Haven refinery in 1940.

Kuwait Oil Output

Output of crude oil in the Sheikhdom of Kuwait, as reported by Gulf Oil Corp. for the Kuwait Oil Co. Ltd. of London, for the month of July was 1,523,663 tons, or about 373,000 barrels daily. This was an increase of 70,130 tons over the previous month and brought the seven-month total to 9,118,603 tons or about 319,000 barrels daily.

Ultramar Plan Developments

Ultramar Company will develop the Mercedes field in Venezuela. Deeper drilling has begun to explore two main oil sand groups. Five wells are already producing, and work will continue to determine the value of these deeper explorations. Shallow core drilling is being used in the Guavinita and Piragua fields to attempt determination of structure.

British Advance Diesel Oil Prices

The British Ministry of Fuel and Power has increased maximum prices for gas oil and diesel oil road vehicle fuel by ⅜ pence per gallon. New maximum prices for bulk deliveries are as follows: gas oil (diesel oil) in inner zone, 1s 0d; outer zone is 1s 0¼d; general zone is 1s 0½d. Derv, inner zone 2s 6¾d; outer zone 2s 7d; general zone 2s 7¼d.

To Establish Geology Chair At Beirut

The Gulf Oil Corp. will assist in the establishment of a chair of geology at the American University of Beirut, Republic of Lebanon, beginning with the 1950 fall term, according to an announcement by Dr. K. C. Heald, Gulf vice president. Dr. Roy A. Wilson, a geologist with Gulf, will occupy the chair and teach three courses: physical geography, engineering geology and physical geology, all of which will be new subjects at the Beirut institution.

Gas Treating Plant for Italy

Following a recent visit to the United States of a group of Italian technical experts representing Azienda Generale Italiana Petroli (AGIP), it is announced that a contract has been signed with the North American Petroleum Gas Corp. of New York for erection in the Cortemaggiore field of northern Italy of a gasoline extraction plant to be operated by AGIP. It is stated that the plant will be the largest of its kind in Europe and will process 100 million cubic feet of gas daily, obtaining gasoline, other distillates, propane and butane.

Engineering of the plant and its equipment is being handled by J. F. Pritchard & Co. of Kansas City, Mo.

Persian Oil Output

Crude oil production in Persia during July totaled 2,801,000 long tons or approximately 690,000 barrels daily, a slight increase over June output, it was announced by Anglo-Iranian Oil Co. Total production for the first seven months was 18,493,000 long tons, about 665,000 barrels daily.

Stone & Webster Canadian Subsidiary

Stone & Webster Inc. has formed a Canadian subsidiary, Stone & Webster Canada Ltd., to make the services of the whole organization available to Canadian industry, according to an announcement by Whitney Stone, president of the parent company. Alfred T. Krook, previously Houston, Texas, district manager of the Stone & Webster Engineering Corp., has been named president of the new company. John W. McKee of Toronto is chairman of the board of directors upon which are serving Whitney Stone and Philip B. Scott of New York, as well as prominent citizens of the Dominion, including Hon. G. Peter Campbell, K. C.; William Eric Phillips, C.B.E., D.S.O., M.C., also of Toronto; and Hartland De M. Molson, O.B.E., of Montreal.

Stone & Webster Engineering Corp and E. B. Badger & Sons Co. of Boston, process engineers, whose facilities were added to the Stone & Webster organization in 1948, recently have completed important projects in the United Kingdom and Canada. These included major chemical and petroleum plants for the Anglo-Iranian Oil Co. Ltd. in England and the Middle East, and large installations in Canada for the Polymer Corp. In addition assistance has been rendered to companies developing the oil and gas resources of western Canada.

John W. McKee Alfred T. Krook

Talk to Lane-Wells' customers—ask them *why* they use Lane-Wells perforating—and their answers will boil down to these three words. And here are the reasons: • LANE-WELLS DEPTH MEASUREMENTS are accepted, industry-wide, as the standard of accuracy because Lane-Wells has taken pains to see that they *are* accurate. Each conductor cable has been individually calibrated and marked, and, as a double check, a collar locator signals the passing of selected casing collars.The measuring sheaves over which these cables run have, built-in, micrometer adjustments to compensate for even the slightest wear.• LANE-WELLS GETS PENETRATION because for every job, there is a Lane-Wells gun that is just right, the right bullet, the right propelling charge. There are six different *types* of bullets, in diameters ranging from 1/16" to 9/16" driven from firing chambers which utilize the peak efficiency of the fibre-packed, accurately-metered powder. KONESHOT charges and guns are available for either open or cased hole jobs. • LANE-WELLS' ENVIABLE SAFETY RECORD is due, in part, to the safety-precautions built into the equipment—such as the five-point safety firing system, which insures that the gun is never "live" except down the hole, in the firing location—and in great part to the ability, the thorough training, and the wide experience of all the Lane-Wells crews.

Ask a Lane-Wells Customer about

LANE WELLS

AG-304

Better Perforating

LOS ANGELES • HOUSTON • OKLAHOMA CITY

General Offices, Export Office and Plant

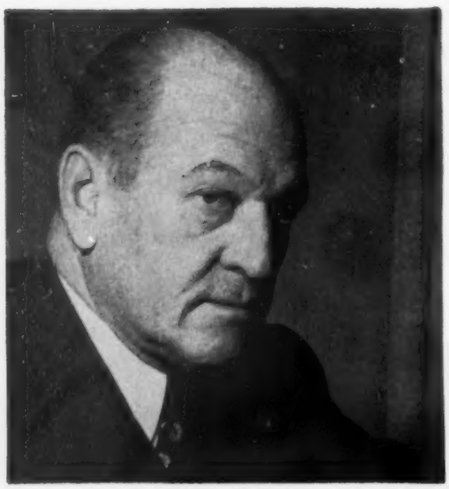
5610 SO. SOTO STREET, LOS ANGELES 58, CALIFORNIA LANE-WELLS CANADIAN COMPANY • IN VENEZUELA PETRO-TECH SERVICE CO.

Norske Shell Personnel Changes

B. Johannsen has been appointed acting manager of A/S Norske Shell to succeed E. Westblad who has retired after ten years as general manager of Shell operations in Norway. Mr. Westblad joined the company in 1914 and five years later was named manager of the Finnmark branch. A year later he became sales and assistant manager of the head office at Oslo. During World War II he was sent to a concentration camp for three years by the Germans.

Iraq Petroleum Company

Production from the Kirkuk field of Iraq Petroleum Company for the month of July is reported as 484,017 long tons (117,100 barrels daily). For the first six months of 1950 production amounted to 2,673,429 tons (110,830 barrels daily). Production in Qatar was 143,179 long tons (35,795 barrels daily) in July, and for the January-June period was 667,233 tons (27,650 barrels daily).



Cyrus T. Helm

CYRUS T. HELM has been elected executive vice president of International Petroleum Co. Ltd. Mr. Helm was made a director of International in 1949 after 28 years' foreign service with New Jersey Standard companies. He was Standard marketing advisor for Latin America at the time of his election to the International directorate.

Alberta's Oil Flows East

A few minutes before 4:00 p.m. on the chilly afternoon of October 4, the Hon. E. C. Manning, Premier of Alberta, opened the valve at the pump station at Edmonton, and western Canada's oil started on its long journey to the east.

It was an impressive ceremony. On the basis of major transportation over thousands of miles, it enters the same category as that of driving the last spike in the Canadian Pacific Railway's right of way so long ago.

Just prior to the event, short speeches were made by J. Grant Spratt, president, Western Canada Petroleum Association; Rt. Hon. C. D. Howe, Canadian Minister of Trade and Commerce; G. L. Stewart, president of Imperial Oil Ltd.; Dr. O. B. Hopkins, president, Interprovincial Pipe Line Co.; and Hon. E. C. Manning, Premier of Alberta.

Chairman of the proceedings was Loren F. Kahle, Interprovincial executive vice president, under whose general supervision the work of the pipeline has been carried out. Others on the platform were the Hon. J. J. Bowlen, Lieutenant Governor of Alberta; S. Parsons, mayor of Edmonton; T. S. Johnston, Toronto, Interprovincial vice president; Hon. N. E. Tanner, Minister of Mines and Minerals, Alberta Government; Senator Norman Lambert, Ottawa; F. M. MacPherson, Board of Transport Commissioners; and Reeve G. W. Mayer of the Strathcona Municipal District. Following the ceremonies, Interprovincial was host at a reception at Edmonton's MacDonald Hotel.

Tone of the speeches touched on the great importance of such an event to the economy of Alberta and Canada, the first step in relief from the long strain of too much oil and too little market; just what such an event would mean to all developers of oil, from the greatest companies to the smallest producers, in the matter of facilitating finance operations and other relative matters.

The completion of this 1,127-mile pipeline was effected less than six months after the big job started. There have been longer lines constructed in past years but none in the record time of under 150 days for this length of mileage.

The distance of the line from Edmonton to Regina is 439 miles. Temporary pumps were started to move the oil after the valve was opened by Premier Manning until the Edmonton pump station is completed within a few weeks. The first deliveries of Alberta's oil to the Regina refineries are expected to be made by the end of October. By the end of November it is to reach the end of the second section of the line—336 miles—at Gretna, Manitoba. By the end of December the oil is scheduled to arrive at the Superior, Wisc., line's terminus.

Next spring when the system is in full operation, 95,000 barrels per day will travel through the line. A total of 70,000 barrels daily will continue eastward beyond Regina with about 55,000 barrels daily arriving at Superior. In addition to the Imperial Oil and Saskatchewan Federated Co-Operatives refineries being supplied at Regina, supplies will also be delivered to the HiWay refinery at Rosetown, Saskatchewan, and the British American refinery at Moose Jaw.

Special reference should be made of the record time on the Canadian side of the line, a distance of 805 miles. This was done in face of the obstacles of severe spring weather conditions causing much delay, to which were added further delays by the floods in Manitoba and Canada's national railway strike. This last factor, of course, retarded deliveries.

The pipeline now lies buried three feet deep in the ground. It is no longer inactive but is serving the purpose for which it was constructed. That will continue night and day, and every day, without ceasing and will not stop until the oil supply of western Canada dies. Normal farm operations are renewed over the pipeline. There is little to indicate the fact that it is there except the patrol flight of the small single-engine plane, the duty of which will be to travel ceaselessly up and down the line searching for leaks. Danny Driscoll, its pilot, made his first flight in this respect on the day the line was opened, the now historic October 4, 1950.

Anglo Egyptian Oilfields

The report of Anglo Egyptian Oilfields Ltd. for the year 1949, submitted to shareholders by Sir Frederick Godber, chairman, showed production of 12,248,000 barrels as compared with 11,413,000 in the year preceding. Output of the Ras Gharib and Hurghada fields continued to decline, but this loss was more than offset by 840,000 barrels representing the company's share in the yield of the Asl field in Sinai, in which the company is jointly interested with Socony-Vacuum Oil Co.

Net income was £185,818 as compared with £241,274 in 1948, after transfer of £200,000 to reserve and a special provision of £250,000 for abnormal depreciation.

BP-Refinery Opened

The rebuilt refinery of BP Deutsche Benzin and Petroleum-GmbH, subsidiary of Anglo-Iranian Oil Co., at Hamburg-Finkenwerder went on stream Sept. 26. The war-damaged plant, which formerly belonged to Davis & Co. Inc. of New York, was sold to Anglo-Iranian Co. after the war. It is situated close to the Hamburg new petroleum harbor on the Elbe river and comprises a Foster Wheeler atmospheric topping plant (daily crude capacity 750 tons) and a rebuilt Winkler-Koch combined topping and cracking plant (daily crude capacity 1,235 to 1,250 tons). With an annual crude intake capacity of 600,000 tons, the refinery constitutes an essential part of the total German refining capacity.

E. E. Boudinot

New Coryton Refinery

E. E. Boudinot, veteran construction engineer for General Petroleum Corp., Los Angeles, has been selected to supervise the construction of a new $30 million oil refinery to be built by the Vacuum Oil Co. Ltd., Coryton, England. The project will take about 30 months to complete. The new Coryton refinery will treat Middle East crude oil primarily and will have a capacity of approximately 20,000 barrels of crude daily. It will specialize in the production of high-grade lubricating oils.

Mr. Boudinot has been with General Petroleum since 1917. He has been concerned largely with the construction and growth of the Torrance refinery.

Search For Oil In British Columbia

Search for oil and natural gas in the Peace River district of British Columbia has increased to the point where over ten million acres are now under permit or application. Among current activities the following may be noted:

Royalite Oil has completed a geophysical study of the Queen Charlotte Islands and the Gulf Islands off the southern coast.

In the Kootenay region of Flathead Valley, Amalgamated Oil is doing geological survey work through an agreement with Pacific Petroleums. That company has sent a 20-man crew into the valley to run tests. If these confirm other indications of oil, a modern rotary rig will be moved into the district. Present plans call for the development of 68,000 acres.

This area is south of the Canadian Pacific Railway's Crow's Nest Line in eastern British Columbia. Seepages have been noted in a band paralleling the main range of the Rockies and about 15 miles to the west. The area extends across the Montana border into Glacier National Park. Oil pools have been reported from as early as 1820.

Allenbee Petroleums is carrying out a drilling program in Surrey municipality, 20 miles south of Vancouver, substituting a rotary for its standard rig which ran into heavy gravel and water in the first 475 feet.

Phillips Petroleum is setting up a rig near the Alaska Highway on the Cameron River about 200 miles north of Prince George. Pacific Petroleums is preparing to deepen a well drilled late last year north of Dawson Creek and plans further test wells in that area.

To Build Cameron Equipment

British Oilfield Equipment Co. Ltd. of London and Leeds has obtained a manufacturing and sales license from Cameron Ironworks Inc. of Houston, under which it will manufacture Cameron products in England for marketing in sterling areas. Equipment covered by the agreement includes well head assemblies, blow out preventers and allied equipment. Special types of Cameron valves will be distributed by BOEC but manufactured by Cameron.

NEW

SERIES 12100*

FORGED STEEL

DROP

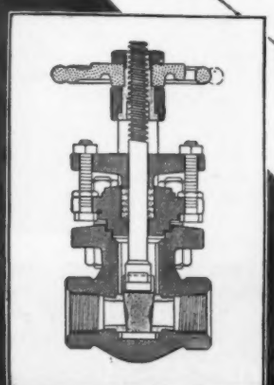
Vogt

BOLTED BONNET
BOLTED GLAND

150-800 POUND

GATE VALVES

SIZES 1/4" to 2"



*Series 12100

CARBON STEEL | 800 Pounds @ 750° F. | 1500 Pounds Cold Non-Shock

For 150-800 pounds service • Round Bolted Bonnet • Bolted Gland • Gasket or Ground Joint • Outside Screw and Yoke • Renewable Seat Rings • Solid Wedge — Slotted Type • Rising Stem 11½-13% Chrome Stainless Steel Trimmings • Sizes 1/4" to 2" inclusive.

HENRY VOGT MACHINE CO. Louisville 10, Ky.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • DALLAS

Oil company staff changes

James W. Foley

A. W. Baucum

JAMES W. FOLEY has been appointed assistant to the chairman of The Texas Co., succeeding James H. Pipkin, who has been made general manager, industrial and public relations. A. W. Baucum has been transferred from Houston to fill Mr. Foley's previous position of assistant to the vice president, producing department. Mr. Foley was petroleum engineer for Bahrein Petroleum Co. in the Persian Gulf from 1937 to 1940 and has held various posts in the United States. In 1948 he was named assistant division manager of the Oklahoma division and in 1949 assistant to the vice president.

R. B. SALE, formerly assistant regional manager of Continental Oil Company's production department, Ponca City, has been promoted to the newly-created position of director of training in the production department, with headquarters in Ponca City. Mr. Sale joined Continental in 1926 and became assistant region manager in 1949.

MYRON C. KIESS, former director of geophysical exploration for the production division of Pure Oil Company, has been appointed chief geologist of Mid-Continental Petroleum Corp. He succeeds Albert L. Beekly, who has retired from active service but continues as a consultant to the company.

A. R. DENISON, who has been associated with the Amerada Petroleum Corp. since 1921 and has been the chief of its geological department since 1937, has been elected a vice president of the company. John F. Hosterman, who has been assistant chief geologist since 1943, succeeds to the post vacated by Mr. Denison, and John P. Thompson and Charles S. Agey have been named assistant chief geologists. Mr. Denison has long been recognized as an outstanding figure among American geologists and is a former head of the AAPG.

JAMES T. RASBURY has joined Deep Rock Oil Corp. as manager of the personnel and industrial relations division. He succeeds J. H. Westbrook, who was transferred to the marketing division. A. L. Springfield is assistant manager. Mr. Rasbury was head of industrial relations for the pipeline department of Sinclair Refining Co. at Independence, Kansas, before coming to Deep Rock.

O. Q. LOMAX has been elected president and A. E. Pecore as vice president of Humble Pipe Line Co. following the retirement of R. V. Hanrahan who has retired after 25 years as head of the company. Mr. Lomax joined the engineering department of Humble Oil and Refining Co. in 1918 and transferred to the pipe line company a year later. He was appointed assistant general superintendent in 1937, and made vice president and general superintendent in 1942. Mr. Pecore joined Humble in 1919 and was named chief engineer in 1945 and general superintendent in 1949.

MILLARD K. NEPTUNE, manager of Continental Oil Company's foreign department, has been appointed special Washington, D. C., representative of the company. He will also continue as manager of the foreign department. In his new position Mr. Neptune will assist all departments in the company's business with federal agencies located in the nation's capital.

DON O. CHAPELL, vice president of exploration and land department, Sunray Oil Corp., has resigned to become associated in land and geological work with Jake L. Hamon, independent oil operator, First National Bank Building, Dallas, Texas. George A. Schwab has been appointed manager of the Sunray land department, and E. A. Markley, chief geologist in the midcontinent area. These departments will operate under the direction of D. R. Snow, vice president, exploration and production.

JOHN L. FERGUSON, formerly senior geologist in charge of geophysical interpretation for Amerada Petroleum Corporation, has been appointed head of Deep Rock Oil Corporation's land and exploration division, President W. H. Garbade announced. Mr. Ferguson fills the position recently vacated by the resignation of W. G. Gish.

A native of Massachusetts, Mr. Ferguson graduated from Dartmouth in 1915 and did postgraduate work at Harvard the following year. His experience in the oil industry, however, began in the summer of 1914 when he joined a Canadian geological survey party as field assistant. After leaving Harvard, he joined Charles N. Gould and Associates in Oklahoma City in 1917 as field geologist. After serving with the Army Engineers in World War I, he renewed his association with Gould. In 1922 he became field geologist for Borealis Oil Co. and in 1928 joined Amerada as district geologist at Amarillo, Texas, remaining with that company until his appointment at Deep Rock.

R. O. TRAYLOR, superintendent of the industrial relations division at the Whiting, Ind., refinery of Standard Oil Co. (Ind.), has been appointed an additional assistant director of industrial relations in the general office at Chicago. F. Roe Weise will continue as the other assistant director of industrial relations in the general office. J. P. Nielsen, supervisor of labor and personnel in the general office industrial relations department, was advanced to superintendent of the industrial relations division at the Whiting refinery to succeed Mr. Traylor.

DONALD W. SOLIS, formerly manager of industrial sales in the Boston regional office of Cities Service Oil Co., has been appointed assistant manager of national sales. With the exception of three years' active duty as a Lt. Commander in the Navy, Mr. Solis has been at the Boston regional office since he joined Cities Service in 1934.

R. R. JACKSON, manager of the Paulsboro, N. J., refinery of the Socony-Vacuum Oil Co. Inc., and S. D. Dalton, manager of the refinery engineering division, have been appointed to the company's manufacturing committee at New York. Mr. Jackson will be succeeded at Paulsboro by E. L. Sinclair, assistant manager. Mr. Dalton will continue as manager also of the refinery engineering division.

Prior to becoming manager of the Paulsboro refinery in 1946, Mr. Jackson was superintendent of the Beaumont refinery. Mr. Dalton was transferred to the Socony-Vacuum refinery engineering division in 1940 from General Petroleum Co.

R. R. Jackson

E. L. Sinclair

S. D. Dalton

STEELS
• for the Petroleum Industry
This organisation has made a special study of steel requirements of the petroleum industry: plates for fusion welded vessels; constructional steel; forgings; alloy steels, including corrosion and heat-resisting types; etc.
The Technical Departments will be pleased to discuss specific applications with manufacturers of petroleum equipment.
THE UNITED STEEL COMPANIES LTD
THE UNITED STEEL COMPANIES LIMITED OF SHEFFIELD ENGLAND
THE LARGEST STEEL PRODUCERS IN THE BRITISH COMMONWEALTH

Ⓡ US 39

Dr. Louis Schmerling

DR. LOUIS SCHMERLING, a research chemist with Universal Oil Products Co., Chicago, has been selected as the recipient of the 1951 Precision Scientific Co. award in petroleum chemistry. The $1,000 cash prize which is administered by the American Chemical Society will be presented during the national meeting of the ACS in April 1951.

Among Dr. Schmerling's accomplishments is the clarification of the mechanism of alkylation of isoparaffins. He is the author of 30 scientific publications and holds 70 U.S. patents. In 1947 he was selected as the first winner of the triennial $3,000 Ipatieff prize in chemistry for his outstanding experimental work in the field of catalysis.

DON V. EELLS has been appointed manager of the new terminal and compound plant of Cities Service Oil Co. (Del.) at Chicago. He is succeeded as manager of the Ponca City, Okla., refinery by S. R. McMurray, formerly foreman of cracking operations at the company's East Chicago, Ind., refinery. Mr. Eells is a long-time Cities Service employee, having joined the company in 1917. He became assistant superintendent at Ponca City in 1925 and was superintendent at Okmulgee, Okla., from 1927 to 1938. He was appointed Ponca City refinery manager in 1942. Mr. McMurray was first employed by the company at Gainesville, Texas, in 1924 and has held various positions at the Chicago plant since 1930.

CHARLES F. WATSON has retired after 50 years' continuous service as a tax accountant for Tide Water Associated Oil Co. At a special luncheon in his honor given by company executives at the Whitehall Club, he was presented with a watch by B. I. Graves, vice president. He joined the company as a messenger in 1899.

TCC Units for Italy

Permolio, S.P.A., Raffinerie Italiane Olii Minerali, Milan, Italy, will build TCC cracking units at its Rome and Genoa refineries. Each will have a capacity of 1,210 fresh feed daily. Foster Wheeler Corp. will design and supervise erection of the new plants. Completion is planned by the end of 1951.

At the Milan refinery Permolio is planning erection of a lubricating oil plant to process Middle East crudes. Units there will include propane deasphalting, furfural extraction and M.E.K. dewaxing.

Maintenance Simplified

De Laval Steam Turbine Co. has announced a new small general service pump designed to simplify maintenance. All parts except the bare pump casing are contained in the rotor assembly. When service work is required, the top cover and plate end studs are removed. The rotor then is lifted out and replaced with another from stock or repaired.

SAMUEL H. ELLIOTT, formerly general manager of the transportation department of The Standard Oil Co. (Ohio), has been appointed general sales manager. He will assist A. A. Stambaugh, senior vice president of the company and director of sales. Mr. Elliott has spent his entire business life with the company since his graduation from Harvard School of Business Administration in 1929. He was elected a vice president of Sohio in 1946 and a director in 1949 and will continue in these capacities. Charles E. Spahr, who has been assistant to Mr. Elliott for several years, becomes manager of the transportation department.

R. I. JACOBI has been appointed assistant superintendent in charge of operations of Sinclair Refining Company's newly acquired refinery at Hartford, Ill. Mr. Jacobi worked for Sinclair during summer school vacations. After graduation in 1933 with an M. S. degree in petroleum refinery engineering from the University of Oklahoma, he was assigned to the Houston refinery where he held several positions.

BERT O. MEADOWCROFT has been appointed assistant to the employee relations advisor for the production department of Gulf Oil Corp. He has been head of the employment unit in the employee relations department. His successor there is John F. Orend Jr., former assistant head.

R. P. MASE has been appointed a southwest sales representative of the petroleum refining division of Arthur G. McKee & Co., Cleveland, Ohio, engineers and contractors in the petroleum refining and iron and steel industries. He will be located in Tulsa. Mr. Mase has been an active petroleum engineer for the past 25 years, and for the past ten years has been chief engineer of the Jones & Laughlin Supply Co., engineering and construction division, Tulsa, Okla.

HENRY L. O'BRIEN has been appointed general counsel of Cities Service Co. and its subsidiaries. He has been an officer and director of the company since 1940 and in recent years has supervised the disposition by Cities Service of its electric utility properties in compliance with the public utility holding company act of 1935, as well as assisting in the recently completed program for simplification of the Cities Service corporate and financial structure.

ROY J. TIBBETS has been elected vice president in charge of all pipelines and a director of Sinclair Refining Co., to succeed W. W. Baker, retired. Mr. Tibbets is a veteran of more than 30 years of service in the pipeline operations of the company.

William H. Morris was elected vice president and general manager of crude pipeline operations and Lewis B. Moon general manager of products lines. Mr. Morris and Mr. Moon have for many years held important positions in the company's pipeline department which now operates 10,800 miles of crude lines and 2,800 miles of product lines.

Roy J. Tibbets

William H. Morris

M. R. Shaffer

M. R. SHAFFER has resigned as office manager and executive assistant in the production division of Cities Service Oil Co., Bartlesville, Okla., to enter petroleum consulting work with offices in the Thompson Building, Tulsa. His experience covers the fields of exploration, development, evaluation and administration. He served as petroleum engineer in Texas and Kansas before moving to Bartlesville. Mr. Shaffer is the son of the late M. R. Shaffer, who was manager of Cities Service Oil Company's production division for years.

CHESTER W. CLEVELAND of Chicago has been appointed to the newly created post of director of public relations of Phillips Petroleum Co. He is a 28-year veteran of newspaper, magazine and public relations fields. R. C. Jopling, heretofore vice president public relations, becomes vice president advertising, and continues in charge of the company's Washington, D. C. office. F. L. Rice, heretofore manager public relations department, becomes manager advertising department.

GROVER C. CONRAD, formerly with Oil Well Drilling Co., has disposed of his interest in the company as of July 1, 1950, and is no longer connected with it. Cecil H. Scott, who has been drilling and production superintendent in the west Texas-New Mexico district, will continue in that capacity. He is vice president of the company. Pat J. Howe is secretary treasurer. There will be no change in personnel in the other districts where the company operates.

IHC Promotes Robert P. Messenger

Robert P. Messenger, vice president of foreign operations of International Harvester Company has been elected executive vice president to succeed Giles C. Hoyt, retired. Edward M. Ryan, director of foreign operations, has been elected vice president in charge of foreign operations to succeed Mr. Messenger. Mr. Messenger went to Europe in 1913 when the first foreign Harvester engineering department was organized. He returned to the United States in 1944 to become assistant to the vice president in charge of engineering and vice president of foreign operations in 1946.

Socony Wildcat Successful

The Socony-Vacuum Oil Co. Inc. has completed its first successful well in Canada, after drilling nine dry holes on its 4.5-million-acre lease holdings. The well, Flint No. 1, is on a 7,700-acre block 50 miles southeast of Edmonton, Alberta, and 42 miles southeast of the Leduc-Woodbend field. The well taps 29 feet of Devonian pay at 4,507 feet in the D-2 zone. Drill-stem tests with a half-inch choke on separate portions of the 29-foot pay section showed estimated daily rates of 700 barrels, 200 barrels and 575 barrels of 33.8 gravity sweet crude.

The bundle of sticks

A wise old man called his quarrelsome sons about him. Taking up a bundle of sticks, he commanded each in turn to break the sticks. All tried, but in vain, and said it could not be done.

"And yet, my boys, nothing is easier to do," said the father, as he undid the bundle and broke the sticks, one by one. "By this example, you can see that united you will be more than a match for your enemies; but if you quarrel and separate, your weakness will put you at the mercy of those who attack you."

The useful truth of this fable is just as timely today as it was when the Greek ex-slave Aesop told it 2,500 years ago. You, a patriot, believing in individual liberty and freedom for all, see our American way of life threatened by the menace of communism abroad and jeopardized at home by complacence, negligence, confusion and incompetence.

As a business leader in your own community, you have a particular responsibility to help unify your fellow citizens and guide their thinking and action--for the strengthening and preservation of the ideals that built America, in fact, made America the envy and goal of the very individuals now seeking to destroy it. *In Union there is Strength.*

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

William C. Foster

Foster Heads ECA

William C. Foster, new administrator of the Economic Cooperation Administration, is a business man who has been active in a number of government agencies. After his service in World War I he joined Pressed Welded Steel Products Co. as a sales engineer and later became president. He was called to Washington in World War II and his services for a number of federal agencies brought him the Medal of Merit. In 1948 he left the Department of Commerce to head the Paris offices of ECA with the rank of Ambassador. He became deputy administrator in 1949 working directly under the retiring administrator, Mr. Hoffman.

Venezuela Production

After reaching a new record level of 1,596,000 barrels per day in early September, Venezuelan production settled back slightly to levels which were still higher than those of 1949. For the week ending September 18, daily average production by operators was as follows:

	Eastern Venezuela	Western Venezuela	Total
Creole	134,001	547,213	681,214
Shell Group	—	479,533	479,533
Mene Grande	210,361	62,152	272 513
Texas-Mercedes	27,464	18,423	45,887
Socony-Vacuum	39,170	—	39,170
Ven. Atlantic	18,964	90	19,054
Richmond	—	17,324	17,324
Pantepec	12,733	—	12 733
Sinclair	11,693	—	11 693
Phillips	7,389	—	7,389
B.C.O.	991		991
Total	462,766	1,125,735	1,587,501

Venezuelan drilling showed an upswing in September to 69 rigs on new drilling, after reaching a two-year low of 66 rigs in August. Distribution was as follows:

	Western Ven. Devel.	Western Ven. Explor.	Eastern Ven. Devel.	Eastern Ven. Explor.	Total
Shell Group	18	4	—	—	22
Mene Grande	1	—	15	2	18
Creole	3	1	3	1	8
Texas-Mercedes	1	—	5	1	7
Ven. Atlantic	—	1	3	1	5
Phillips	—	—	3	1	4
Socony	—	—	2	1	3
B.C.O.	1	1	—	—	2
Total	24	7	31	7	69

Texas Co. have announced that they will soon add another string of tools in the Mara field, and Mene Grande will pick up rigs gradually until they have 21 in eastern Venezuela by Jan. 1-17 on development drilling, four on wildcats.

Exploration activity in Venezuela continued at a reduced pace in September, with 28 parties in the field. Freak weather hampered operations, with rainfall records being broken in eastern Venezuela and with the Lake Maracaibo area visited in rapid succession by two twisters, a flood, and a minor earthquake which toppled several derricks. The following table illustrates the kinds of party active and their distribution by companies:

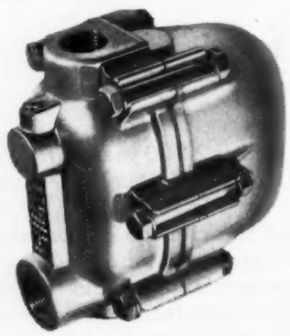
	Seis.	Geol.	Grav.	Str. Drl.	Elec.	Total
Shell Group	4	1	1		1	7
Creole	1	4	1			6
Texas-Mercedes	1	1	1	1		4
Socony-Vacuum	2	1				3
Mene Grande	1	1		1		3
Phillips		2				2
Ven. Atlantic		1				1
Richmond	1					1
Sinclair	1					1
Total	11	11	3	2	1	28

Socony will soon add two seismic contract parties, one in the Barinas area and the other in Anzoategui. Work by the Marine Instrument Co. of Dallas on a joint four-company project over water in Lake Maracaibo is continuing.

New Six-Wheel Trucks

International Harvester Export Co. has introduced 12 new six-wheel truck models featuring many important engineering and structural innovations, it has been announced by C. E. Stevens, motor truck sales manager. They are designed for heavy loads on or off the highway, through deep sand, muddy fields and under other adverse conditions. Gross weights range from 22,000 to 45,000 pounds. An outstanding feature is a new third differential mounted on the forward tandem axle. A single propeller shaft runs to the forward axle and from there, through the third differential, to the rear axle. This construction has resulted in fewer moving parts, and less complicated drive with shorter wheelbases. Points of lubrication also have been reduced. Center of gravity is lower.

One of the unusual features of this FT-60 series of ball-float steam traps is that the case is a hot brass pressing (cadmium-plated bolts); probably one of the deepest and most difficult hot pressings ever made. But that is only a bit of the story.



Somewhat unusual in steam trapping

It may seem unusual to find a single firm making nearly 180 separate standard patterns of steam traps to meet the widest needs of industry.

Even more unusual, perhaps, to find that such a firm doesn't after all sell steam traps (like so much hardware) but good steam trapping methods.

And one might feel it is something quite off the beaten track to find that same firm concerning itself almost wholly and solely with methods of improving heat transfer from steam, of which good steam trapping methods are an essential part.

Thus the services to the oil industries from this single source include: (A) advice on any steam-heat transfer problem; (B) condensate drainage equipment (steam traps, pipeline strainers, sight glasses) for every requirement from vacuum up to 275 psi; (C) automatic air venting equipment for steam or water or oil lines and plant; (D) steam separators for *individual* steam drying at the inlets to steam units; (E) flash steam and condensate recovery equipment (including automatic pumping and lifting from vacuum and low pressure); (F) indicating steam metering equipment for departmental readings.

Will you please cut out and mail the request slip for information.

SPIRAX HEAT TRANSFER

SPIRAX STEAM TRAPPING AND AIR VENTING

Request slip to SPIRAX MANUFACTURING CO. LTD., CHELTENHAM, ENGLAND

Please send information as checked: .....A .....B .....C .....D .....E .....F

NAME: .....

ADDRESS: .....

PET 1150

BOOKS

PRACTICE OF LUBRICATION—T. G. Thomsen	$ 6.50
PETROLEUM PRODUCTION ENGINEERING—L. C. Uren "Oil Field Development"	$ 7.00
PETROLEUM PRODUCTION ENGINEERING—L. C. Uren "Oil Field Exploitation"	$ 6.50
PETROLEUM PRODUCTION ENGINEERING—L. C. Uren "Petroleum Production Economics"	$ 7.50
PETROLEUM REFINERY ENGINEERING—N. L. Nelson	$ 9.00
PETROLEUM PRODUCTION (5 Volumes)—Park J. Jones	
Vol. I—Mechanics of Production: Oil, Condensate and Natural Gas, 1946	$ 4.50
Vol. II—The Optimum Rate of Production, 1946	$ 4.50
Vol. III—Oil Production by Water, 1947	$ 5.00
Vol. IV—Condensate Production and Cycling, 1948	$ 5.00
Vol. V—Oil Production by Gas & Flooding, 1948	$ 6.00
PRINCIPLES OF SEDIMENTATION—2nd Edition—W. H. Twenhofel	$ 6.50
PETROLEUM CHEMICALS INDUSTRY—Richard Frank Goldstein	$ 8.50
QUALITY CONTROL & STATISTICAL METHODS—Schrock	$ 5.00
ROTARY DRILLING HANDBOOK—4th Edition—Brantly	$ 7.50
THE SPERRY SUN LATITUDE AND DEPARTURE TABLES	$ 5.00
SAFETY IN PETROLEUM REFINING & RELATED INDUSTRIES—George Armistead, Jr.	$10.00

TO ORDER WRITE TO

Book Dept. World Petroleum

2 W. 45th ST. NEW YORK 19, N. Y.

OVER 6000

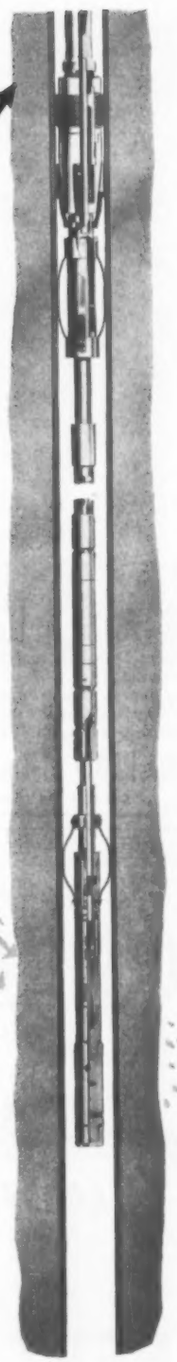
SUCCESSFUL JOBS RUN with

SHOOT-N-TEST

FORMATION AND CASING TESTING

JOHNSTON

Trademark



Here's the accurate, safe, dependable method of developing drilling programs efficiently and economically...

UNDER ALL KINDS OF CONDITIONS!

In wells of any depth

Shoot-N-Test has been used in wells ranging in depth from 300 feet to 15,000 feet.

With directional drilling

Shoot-N-Test has been used on all types of slant hole wells, including the world's flattest well which was 120° off vertical. Shot at 11,890 feet.

For any number of perforations

Shoot-N-Test has been used to shoot as few as 4 shots and as many as 252 in one run.

M. O. JOHNSTON
OIL FIELD EXPORT CORPORATION
EXPORT SALES
3035 Andrita St., Los Angeles 65, Calif., U. S. A.
CABLE ADDRESS "MOJOC"

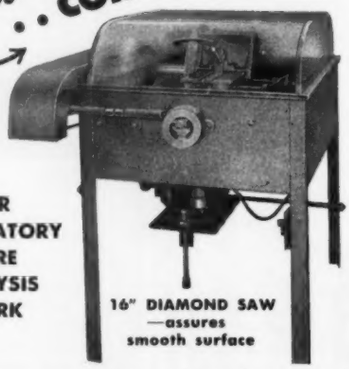
- *Save wear and tear on equipment*
- *Cut many hours off completion time*
- *Get wells on production faster*

PERFORATE AND TEST IN A SINGLE RUN!

Steam Generator Booklet

Advantages of the dual circulation steam generator over conventional boilers are detailed in a copyrighted booklet issued by Foster Wheeler Corp. under the title, "Dual Circulation Steam Generators for power and process steam of super purity." The first of a group of Foster Wheeler generators of the new design was placed in service at a large midwestern refinery in May 1948. Units have produced steam of much greater purity than was attainable in a boiler of conventional circulation. Copies of the booklet are available on request to Foster Wheeler Corp. at 165 Broadway, New York 6.

New .. CORE SLICER



FOR LABORATORY CORE ANALYSIS WORK

16" DIAMOND SAW —assures smooth surface

Specifically designed for sawing thin sections from cores for microscopic study . . . holds tolerances of .002. Also used for splitting cores, squaring-up sections, etc. Widely acclaimed for its precision workmanship and economy.

WRITE FOR LITERATURE

HIGHLAND PARK MANUFACTURING CO.

1009 MISSION ST. . SOUTH PASADENA, CALIF.

Test Cars Displayed

Two of the Du Pont Company's newest gasoline-test cars have been displayed recently to representatives of the petroleum and automotive industries of the New York area. The cars were on exhibit from Aug. 23 to Sept. 1 at the halfway point of a more than 15,000-mile tour by Du Pont representatives for demonstration meetings with refining, marketing and research groups. The cars are equipped for determining octane ratings of motor fuels under road conditions and for demonstrating methods of rating gasoline.

A battery of pushbuttons on the instrument panel permits the driver to draw gasoline from any of ten tanks. An aircraft-type gauge makes it possible for the operator to determine temperatures of engine, radiator water, oil and outside air. Other instruments show manifold vacuum, engine speed, back pressure of the exhaust and spark advance. The test autos are equipped with a hydraulic device which allows the driver to advance or retard the spark. The degree of spark change is visible to driver or observer through a window in the floorboard and an opening in the flywheel housing.

Oil Film Wins Award

At the recent International Film Festival in Venice, the Anglo-Iranian Oil Company's technicolor film, "As Old as the Hills", made by Halas and Batchelor Cartoon Films, was awarded, jointly with a film entitled "Introduction to the Frog", the first prize in the natural science film class. "As Old as the Hills" depicts in animated color the laying down, millions of years ago, of the great oil-bearing strata. It shows prehistoric beasts and the landscape of the period, the piling-up of silt, its packing down and hardening into rock, formation of the limestone strata and cap rock, and finally the folding of the earth's crust which has formed the anticlines or "whalebacks" where oil can be found today.

The Standard Oil Building at 26 Broadway, New York, known by that name since its construction in 1885, has assumed the name of its present occupant-owner, Socony-Vacuum Oil Company Inc. The building actually has been misnamed since 1931 when Standard Oil Co. of New York, the owner, and Vacuum Oil Co. merged to become Socony-Vacuum.

ROGERS-RAY INC.

SEISMIC SURVEYS

CONSULTING...CONTRACTING

ROBERT H. RAY CO.

GRAVITY SURVEYS • GEOPHYSICAL ENGINEERING

World Wide in Performance

2500 Bolsover Road HOUSTON, TEXAS

The ECONOMICS of UNITED STATES and WORLD OIL

A detailed study of the law of supply and demand in terms of U. S. and World oil

Being an outline and analysis of how the basic economic factors governing oil supply, demand, price and time lag of the United States oil industry and other factors of the countries abroad control and will govern the future development of the world oil industry.

by E. Ospina-Racines

Member of: A.I.M.E.; A.A.P.G.; A.C.S.

CONTENTS - CHAPTERS

1. Pattern of the Oil Supply-Demand-Price Cycle.
2. Operation of U. S. and World Supply-Demand.
3. World Oil Demand and Markets.
4. Pricing Crude Oil in the World Market.
5. World's Undiscovered Commercial Oil Land.
6. Appraising Prospective Oil Land.
7. Conversion of Prospective into Commercial Oil Land.
8. U. S. and World Oil Policies.
9. Appendix.

Leather loose-leaf binder; over 72 tables; 37 graphs, printed. Text of 198 pages mimeographed 8½" x 11". Very limited edition. Send for prospectus on book. Price $25 per copy. Handy color tab chapter index.

E. OSPINA-RACINES, Publisher

Mail address: Apartado Aereo 49-45 Bogota, Colombia-South America

DESIGNED & DEVELOPED FOR
VALVES
OILFIELD
EFFICIENCY
AND FITTINGS
Cast & Forged Steel, Cast Iron & Gunmetal Gate,
Stop & Check Valves for low, medium & high
pressures & temperatures. Famous Newman-Milliken 6,000 lbs. Kerosene
Tested Glandless Lubricated Plug Valves for Xmas Trees, Mud Lines etc.
SEND FOR FULL DETAILS TO
Newman, Hender & Co. Ltd
WOODCHESTER, GLOS. ENGLAND

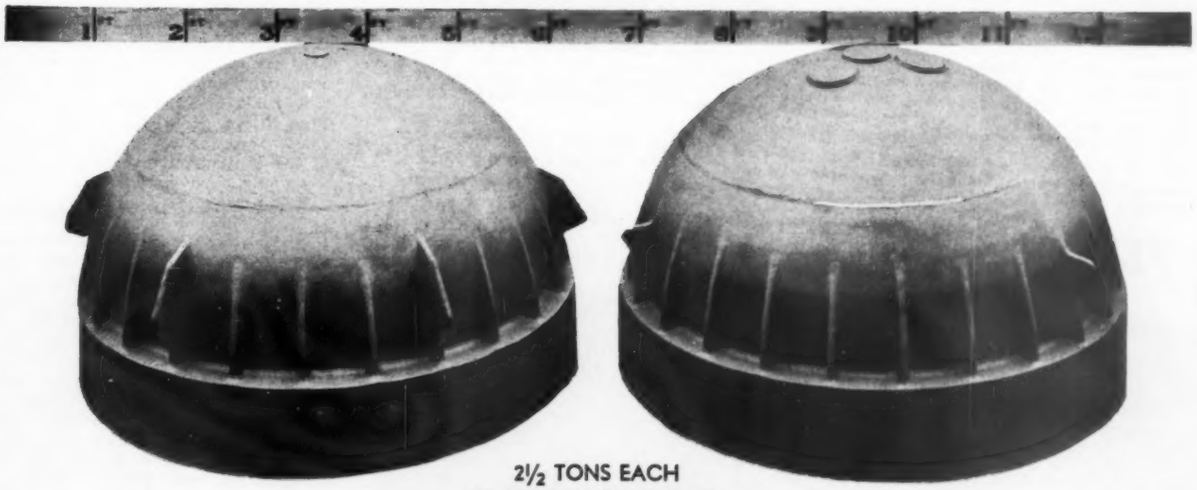
SPECIALISTS IN

CAST CHEMICAL PRESSURE VESSELS

MANGANESE BRONZE
ALUMINUM BRONZE
SILICON BRONZE
GUNMETAL

FOR USE AT HIGH PRESSURES & LOW TEMPERATURES

UP TO 8 TONS EACH IN WEIGHT



2½ TONS EACH
IN MANGANESE BRONZE
BY PERMISSION OF ONE OF OUR LARGEST CUSTOMERS

PHONE
STOKE-ON-TRENT
87303/4

BILLINGTON & NEWTON LTD.
LONGPORT, STAFFORDSHIRE, ENGLAND

GRAMS
BRONZE
LONGPORT

Pemex Buys Tankers

Capacity of Mexico's oil tanker fleet has been increased 400,000 barrels by the purchase of six tankers costing $4,955,000 U.S. Five were built in the United States, and the sixth was bought in Spain. Four of the U. S. purchased tankers are of the Liberty type, built in 1944, with a capacity of 70,000 barrels each. The fifth was built in 1948 and has a capacity of 35,000 barrels. Largest of the new vessels is the "Presidente Aleman", with a capacity of about 85,000 barrels, which is to be delivered from Spain in November.

Wherever
CONTROL
is vital
L-32 Immersion Thermostat
22-R Hydramotor Valve
K-10 Magnetic Lever Valve
V-25 Gas Fuel Governor
GENERAL CONTROLS are in charge!
GENERAL CONTROLS
Glendale 1, California
Manufacturers of Automatic Pressure, Temperature, Level and Flow Controls
FACTORY BRANCHES: Baltimore 5, Birmingham 3, Boston 16, Buffalo 3, Chicago 5, Cincinnati 2, Cleveland 15, Dallas 1, Denver 4, Detroit 8, Glendale 1, Houston 6, Kansas City 2, Minneapolis 2, Newark 6, New York 17, Philadelphia 23, Pittsburgh 22, St. Louis 12, San Francisco 7, Seattle 1, Tulsa 6.
DISTRIBUTORS IN PRINCIPAL CITIES

E. F. Wentworth, Jr.

Heads Legal Department

E. F. Wentworth Jr. has been appointed head of the legal department of Foster Wheeler Corp. with the title of general attorney. Mr. Wentworth has been with Foster Wheeler since April 1941, and for 12 years prior thereto was engaged in general and patent law practice in New York City and Newark, N. J.

Mid-West Installs Platforming Unit

L. A. Woodward, president of Mid-West Refineries, has announced that the company is installing at its Alma, Michigan, refinery a 1,500-barrel-per-day Platforming unit. The Platforming process was developed by Universal Oil Products Co. and was first announced to the industry in March 1949. Since that time it has been adopted by a number of companies as a means of converting regular gasoline into a higher quality product with octane numbers better than those of the normally accepted premium grade.

Actually the Platforming process reforms gasoline already produced from crude oil. It represents a further step in advance from the initial process of distillation and the later improvement through the introduction of cracking. Platforming employs a specially developed catalyst containing percentages of platinum. This catalyst provides an unusual reaction and gives substantial increase in octane, which is claimed to yield the highest quality of automobile fuel.

Installation of the Platforming unit is one part of a progressive program now being carried out by Mid-West. In this program the capacity of the refinery is being increased from 4,200 to 10,000 barrels per day, permitting the treatment of an additional 5,800 barrels of crude daily after the new facilities go into operation.

To provide its added requirements, Mid-West has acquired pipeline facilities through the purchase of the Michigan division of the Sohio pipeline comprising a crude oil line running from Toledo, Ohio, into central Michigan. This property was purchased by Michigan-Ohio Pipeline Corp., a subsidiary of Mid-West Refineries Inc., and it is the only interstate crude pipeline operating in Michigan. The new facilities at Alma are expected to go into operation early in 1951.

To Increase Black Capacity

Phillips Chemical Co. will erect an additional plant for the production of high abrasion furnace black, adjacent to the present plants in the vicinity of Borger, Texas. Completion is scheduled for late 1951. Philblack O was first marketed in 1947, and capacity has since been expanded to about 90 million pounds per year. The new unit to be constructed will raise overall capacity to approximately 160 million pounds per year.

Independent Products Line

United States Pipe Line Co. has announced plans to build a product pipeline system from the Texas Gulf Coast to St. Louis, Chicago and other middle west markets. The system will transport gasolines, distillates and LPGas. It is planned as an independently-owned and operated common-carrier, with no shipper-owner affiliations, with no investments by oil company shippers. Contracted reservations for space will be offered to assure each company adequate transportation, irrespective of competitive tenders.

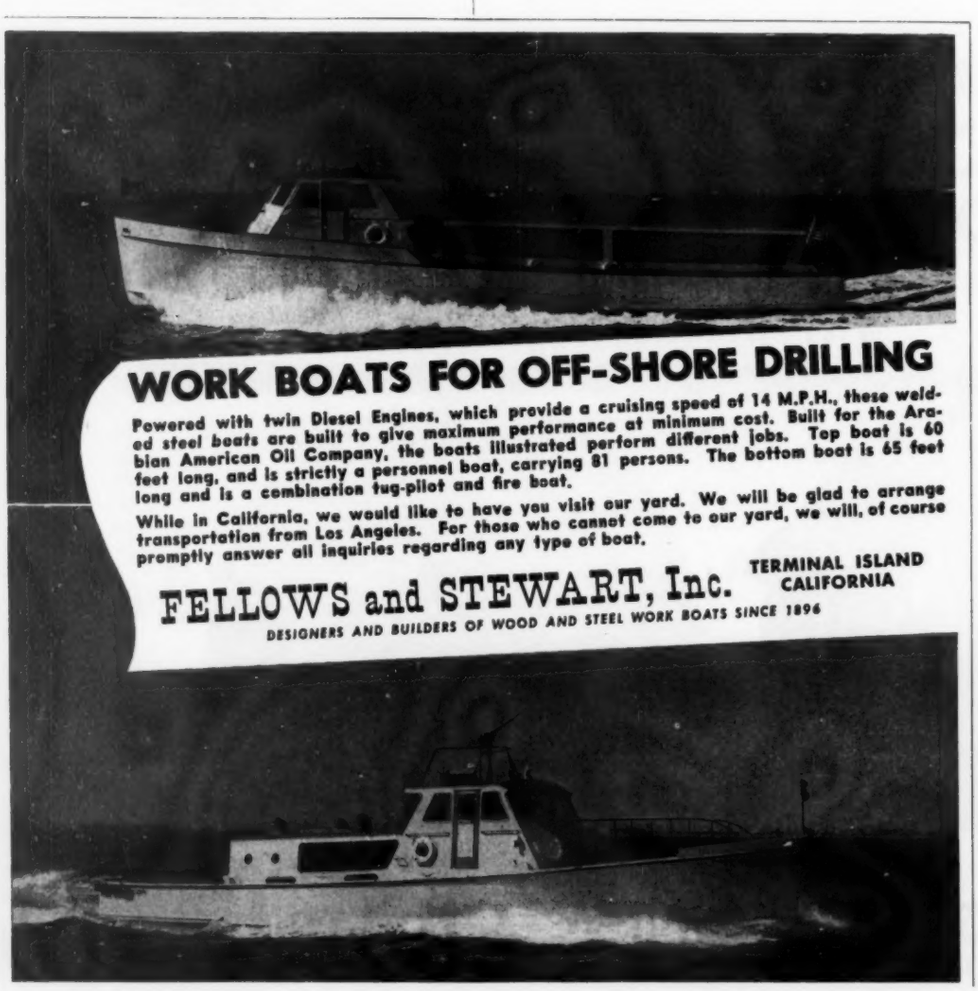
Adequate finances, satisfactory steel supplies and experienced management have all been arranged, and early construction is planned, with particular consideration for the accelerated urgency and broad flexibility demanded of this system as an element in the integrated overall national defense program. The project, which has been under development for several years, has received interested approval of Gulf Coast refiners who desire to market in the middle west.

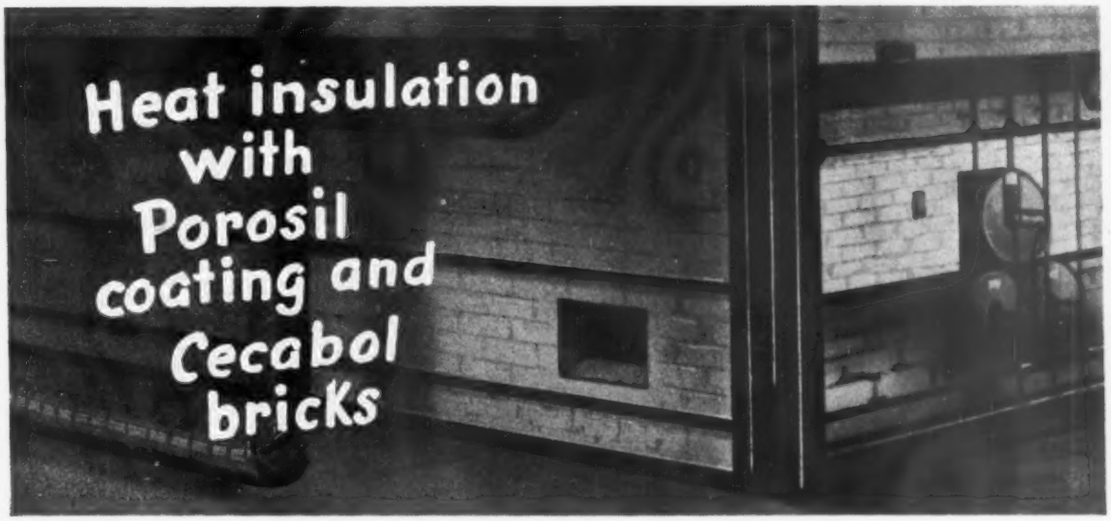
E. Holly Poe and Paul Ryan, with offices at 70 Pine Street, New York City, are the principal officers responsible for the present development of the United States Pipe Line Company.

High-Additive-Content Lube Oils

An entirely new type of lubricating oils was discussed at the October 1949 meeting of the ASTM Committee D-2 on petroleum products and lubricants at San Francisco. These new oils, known as Series 2, differ from the previous heavy-duty oils in that they contain from five to ten times as much additive, and they may have as much as two percent of ash constituents. They were developed primarily at the request of the Caterpillar Tractor Co. to meet a field condition involving severe operation of diesel engines using fuels with as much as one percent of sulfur. Experience has now proved that these new lubes eliminate practically all corrosive wear and engine fouling in diesels served with high-sulfur fuels.

The five papers contributed to the symposium have been published by ASTM at Philadelphia under the title, Symposium on High Additive Content Oils; $1.75.


WORK BOATS FOR OFF-SHORE DRILLING
Powered with twin Diesel Engines, which provide a cruising speed of 14 M.P.H., these welded steel boats are built to give maximum performance at minimum cost. Built for the Arabian American Oil Company, the boats illustrated perform different jobs. Top boat is 60 feet long, and is strictly a personnel boat, carrying 81 persons. The bottom boat is 65 feet long and is a combination tug-pilot and fire boat.
While in California, we would like to have you visit our yard. We will be glad to arrange transportation from Los Angeles. For those who cannot come to our yard, we will, of course promptly answer all inquiries regarding any type of boat.
FELLOWS and STEWART, Inc.
TERMINAL ISLAND CALIFORNIA
DESIGNERS AND BUILDERS OF WOOD AND STEEL WORK BOATS SINCE 1896



ACTIVATED CARBONS, SILICA GEL
DECOLOURISING AGENTS, FILTER AIDS
ION EXCHANGERS, ACTIVATED DOLOMITE
BENTONITES, PINE TARS
INSULATING MATERIALS, KIESELGUHRS

C.E.C.A

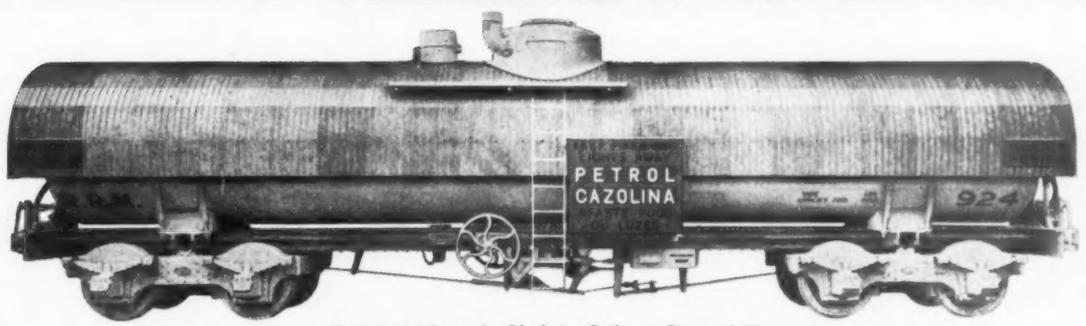
THE BRITISH CECA COMPANY LTD
175 PICCADILLY — LONDON - W.1.

RECOVERY OF SOLVENTS, BENZOLE RECOVERY
AIR CONDITIONING, GAS DRYING
ELECTROSTATIC PRECIPITATION, DETARRING
ELECTROSTATIC SPRAY COATING
GENERAL TREATMENT OF WATER

Telephone: Regent 0856 (3 lines) - Telegrams: Acticarbon, Piccy, London
ONE OF THE CECA GROUP OF COMPANIES

HURST-NELSON & CO LTD

DESIGNERS & BUILDERS OF ROLLING STOCK



Bogie Tank Wagon for Rhodesian Railways. Gauge 3' 6".

We are fully conversant with and experienced in working to the standards specified by the Principal Railways of the World and are organised to give universal service in design and manufacture to any prospective purchaser of our products at Home and Abroad.

HURST, NELSON & CO., LTD.
Motherwell, Scotland
Telephone: Motherwell 500
London Office: 9, Bishopsgate, London, E.C. 2
Telephone: LONdon Wall 5050

Bogie Tank Wagon for Malayan Railways. Metre Gauge.

Bogie Tank Wagon for Venezuela. Gauge 3' 0".

A. R. Kelso

A. R. Kelso Named Mack Vice President

A. R. Kelso has been elected vice president of Mack Trucks, Inc., and a director and vice president of Mack Manufacturing Corp., the parent company's wholly-owned manufacturing subsidiary. He will be in charge of manufacturing and production at all Mack plants, with headquarters at Allentown, Pa.

New Marine Depot Planned

British American Oil Co. will build a marine depot at Port Stanley, Ontario, Canada. Two 20,000-barrel and one 40,000-barrel gasoline storage tanks will be erected. A pipeline will be laid from the tanks to the west docks for the unloading of oil tankers from the harbor.

New Canadian Refinery

An $18 million refinery to process Alberta crude will be built at Froomfield, Ont., by the Canadian Oil Refineries subsidiary of Canadian Oil Companies, W. Harold Rea, president, has announced. The new plant is scheduled to begin operating in April 1952. Stone and Webster Engineering Corp. has been appointed project manager.

Crude will be supplied by tanker from Superior, Wisc., eastern end of the Interprovincial Pipe Line in which Canadian Oil has a $900,000 interest. The company's nearby Petrolia refinery will switch over to Alberta oil as soon as the 1,150-mile pipeline from the prairies is completed next spring.

Land in addition to that owned at Froomfield has been bought. The refinery and satellite structures will be built on a 200-acre site, with an extra 200 acres held in reserve for future expansion and possible establishment of new industries using petroleum products or by-products.

The new refinery will include a 20,000-barrel atmospheric and vacuum distillation plant; a catalytic reforming installation to upgrade low-octane naphtha into high-quality motor gasoline; a catalytic cracking unit; an installation to produce desulfurized fuel gas; a catalytic polymerization unit; and liquefied petroleum gas recovery equipment.

Storage tanks holding 900,000 barrels will be erected at Froomfield to augment the present 800,000-barrel capacity there and at Petrolia. Large storage capacity is required for use after lake navigation closes each year. Spring, summer and fall deliveries of finished products will be made by the company's tanker, the John Irwin, to marine terminals at Hamilton, Toronto, Fort William and Parry Sound. Docking facilities at Froomfield will permit simultaneous berthing of a crude oil tanker and the product tanker. A siding inside the plant will have loading capacity for 30 railway tankcars. Loading facilities for tank transports will also be provided. The usual auxiliary installations will be erected.

Plans Export Expansion

Agate Corp., Los Angeles, is planning expansion of its sales organization to include fields east of California and foreign areas. The company has spent the past two years in pioneering its special filter trap designed for wells which present special sanding and gas problems. Head of the company is N. Paul Whittier of the M. H. Whittier Company.

Cooper-Bessemer Adds To Field Staff

Clayton L. McDougall has been appointed sales and engineering representative in the Odessa, Texas, office of The Cooper-Bessemer Corp. Mr. McDougall is a graduate engineer and has been at Mt. Vernon, Ohio, headquarters for the past six years. At Odessa he will work under the direction of Arthur W. Abel Jr., branch manager.

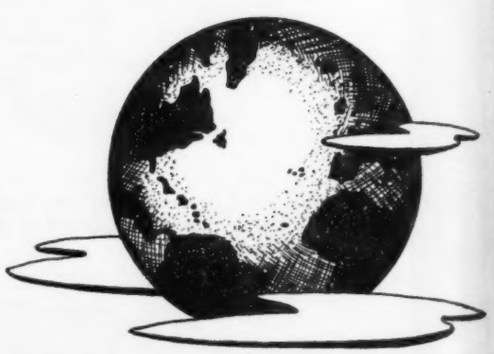
Clayton L. McDougall

A NEW SERVICE...

available to the Petroleum Industry throughout the world

International Petroleum Consultants, Ltd., a new organization, through its staff of experienced petroleum engineers, geologists, geochemists and paleontologists . . . provides the petroleum industry with a source of technical services unmatched in the industry. Working through its world-wide service companies, this organization offers a wide range of engineering, geologic, economic and laboratory services including differential thermal analysis, radioactivity measurements, relative permeability measurements, P. V. T. relationships of oil and gas, etc.

These laboratory facilities and services are at your disposal . . . on a 24-hour basis. We invite your inquiry.



International Petroleum Consultants, Ltd.

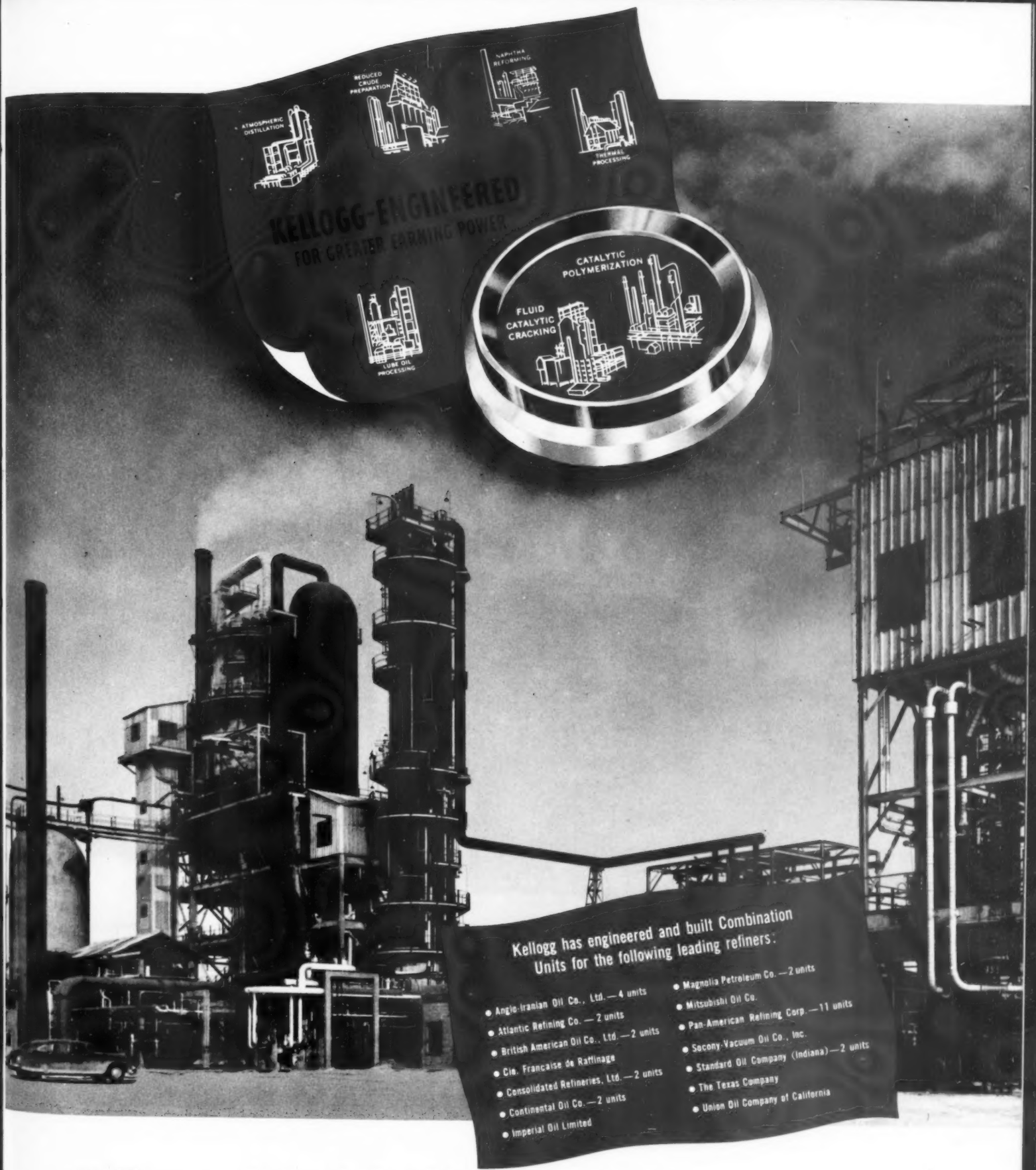
Serving the world-wide Petroleum Industry through these service companies

Oil Properties Consultants, Inc.
709 S. Fair Oaks Ave., Pasadena 2, California
Cable Address PEACO

Petroleum Engineering Associates, Inc.
709 S. Fair Oaks Ave., Pasadena 2, California
Cable Address PEACO

Geological Engineering Consultants, (Cuba), Inc.
Calzada 109, Apt. 2, Vedado, Habana, Cuba
Cable Address GEOLCUBA

Petroleum Industry Consultants, C. A.
Edificio Carabobo, Caracas, Venezuela
Cable Address PETICON


ATMOSPHERIC DISTILLATION
REDUCED CRUDE PREPARATION
NAPHTHA REFORMING
THERMAL PROCESSING
KELLOGG-ENGINEERED
FOR GREATER EARNING POWER
LUBE OIL PROCESSING
CATALYTIC POLYMERIZATION
FLUID CATALYTIC CRACKING
Kellogg has engineered and built Combination Units for the following leading refiners:
• Anglo-Iranian Oil Co., Ltd.—4 units
• Atlantic Refining Co.—2 units
• British American Oil Co., Ltd.—2 units
• Cie. Francaise de Raffinage
• Consolidated Refineries, Ltd.—2 units
• Continental Oil Co.—2 units
• Imperial Oil Limited
• Magnolia Petroleum Co.—2 units
• Mitsubishi Oil Co.
• Pan-American Refining Corp.—11 units
• Socony-Vacuum Oil Co., Inc.
• Standard Oil Company (Indiana)—2 units
• The Texas Company
• Union Oil Company of California

Kellogg-engineered Combination units have a total capacity of more than a half-million barrels per day!

Yes! Exclusive of lube oil facilities, Kellogg has engineered major refinery Combination units with a total capacity greater than 500,000 BPD...with more capacity building!

IN this type of processing Kellogg engineers have led the way since the early '30's when they designed the first topping-cracking combination. In the ensuing years, various economical combinations have been built, including distillation, cracking and reforming; distillation and delayed coking; and most recently, distillation and deasphalting in one combination, with another Fluid catalytic cracker-cat poly combination (pictured on reverse side) as a second step.

Common advantages are elimination of intermediate storage, reduction in heat requirements, simplified piping and pumping layouts, and of course easier operation from a common control room. While flexibility is compromised to some extent, refiners facing heavy competition can well afford to look closely at the lower initial cost and lower operating costs inherent in combination processing. The experience gained by Kellogg is unduplicated both in total capacity built and in diversity of types engineered.

COORDINATED, INTEGRATED ENGINEERING IS KEY!

Engineering a true combination unit is not just a case of connecting together two or more individual process units, with instruments in a common location. Rather, it is the integrated engineering of these units into one processing whole. Albeit flexibility to vary individual unit throughputs and yields must be built in, the combination unit, in general, must be designed so that each processing step is exactly balanced with its predecessor.

Only a large engineering organization can put the necessary number of individual specialists to work as a coordinated team on such a project. Only a completely integrated organization is conditioned to the "give and take" that must be achieved between several individual engineering specialists in order to create a completely successful combination unit. (*Illustrated*—south side of the entire floor devoted to piping engineering at Kellogg headquarters).

IT TAKES ALL SEVEN TO PRODUCE GREATER EARNING POWER...

1 THE DEVELOPMENT "TOOLS"
—laboratories, pilot plants and recognized specialists to prove and improve processing and equipment ideas.

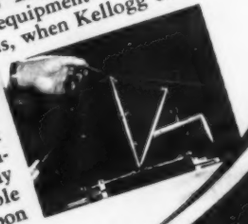
2 PROCESS ENGINEERING
by three distinct groups of specialists—*sequence* engineers, *unit* engineers and *development* engineers—supported by an extensive reservoir of exclusive data.

3 SPECIALISTS IN EVERY PHASE
of design engineering due to the completeness of Kellogg's engineering staff.

4 SPECIALIZED BUYERS
backed by the cumulative buying power of the largest company in the business.

5 COMPLETE FABRICATING FACILITIES
to make schedule deadlines and to develop workable "firsts" in refinery equipment.

6. CONSTRUCTION KNOW-HOW
acquired in completing hundreds of major jobs plus a more important factor . . . constant and close integration with the design engineering staff. This day-by-day liaison begins when the first pencil is put to paper by a design engineer. Further, it starts at the same time with the Schedules Engineer as well, continuing as each piece of equipment and each length of pipe is ordered. Thus, when Kellogg construction engineers take the field, they not only know from the plans what they are about to undertake, but the field construction methods (down even to guy derrick lifts) and timetable have all been agreed upon in detail *in advance*.



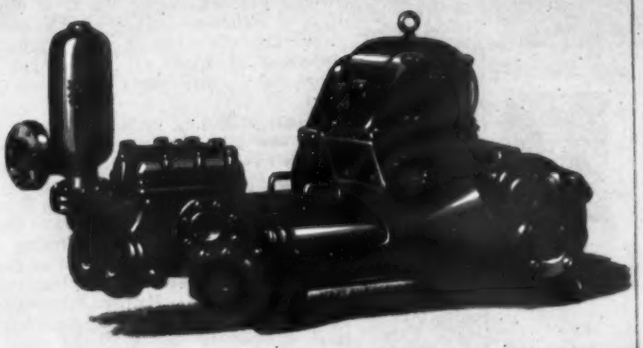
7 PRACTICAL OPERATING COUNSEL
on all design and construction, achieved through practical operating men working as an integral part of the company.

...AND ONLY KELLOGG HAS ALL SEVEN!

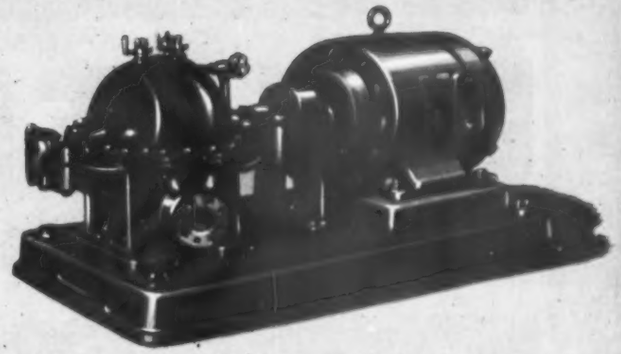
The M. W. Kellogg Company, (a subsidiary of Pullman Incorporated), New York, Jersey City, Los Angeles, Tulsa, Houston, Toronto, London, Paris

PUMPS

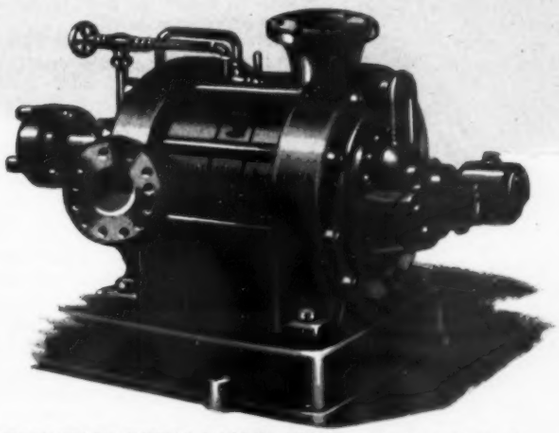
for the Oil Industry



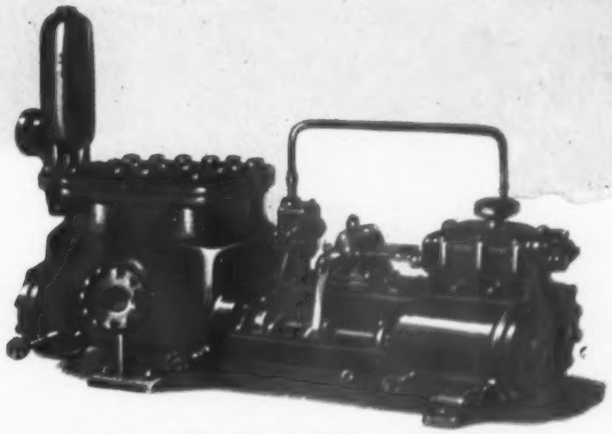
TOTALLY ENCLOSED DUPLEX PUMP for motor or engine drive by gearing, vee ropes or flat belts. A fabricated steel skid type base plate can be supplied if desired. The pump end can be fitted with liners, pistons, valves, etc., to suit any service requirement.



2-STAGE MEDIUM LIFT VOLUTE TYPE PUMP. Made in sizes from 2" to 6" delivery branch for heads up to 250 ft. Normally supplied with cast iron casing and bronze internal parts but special materials can be supplied if desired. For direct or belt drive.



MULTI-STAGE MOTOR DRIVEN PUMPS made in a range of sizes up to 6" diameter delivery branch, with from one to ten stages, suitable for heads up to 1000 ft. Cast iron casings and bronze internal parts. Can be supplied for higher pressures with cast steel casings.



A typical Evans **DUPLEX STEAM PUMP.** Built for extreme service. Can be fitted with removable liners of material to suit all requirements and valve service to suit varying liquids. Simplex steam pumps and steam jacketed pumps on similar lines are also made in a range of sizes.

Joseph Evans & SONS (WOLVERHAMPTON) LTD.

LONDON OFFICE · 32 VICTORIA STREET S·W·1

New Catalyst Plant

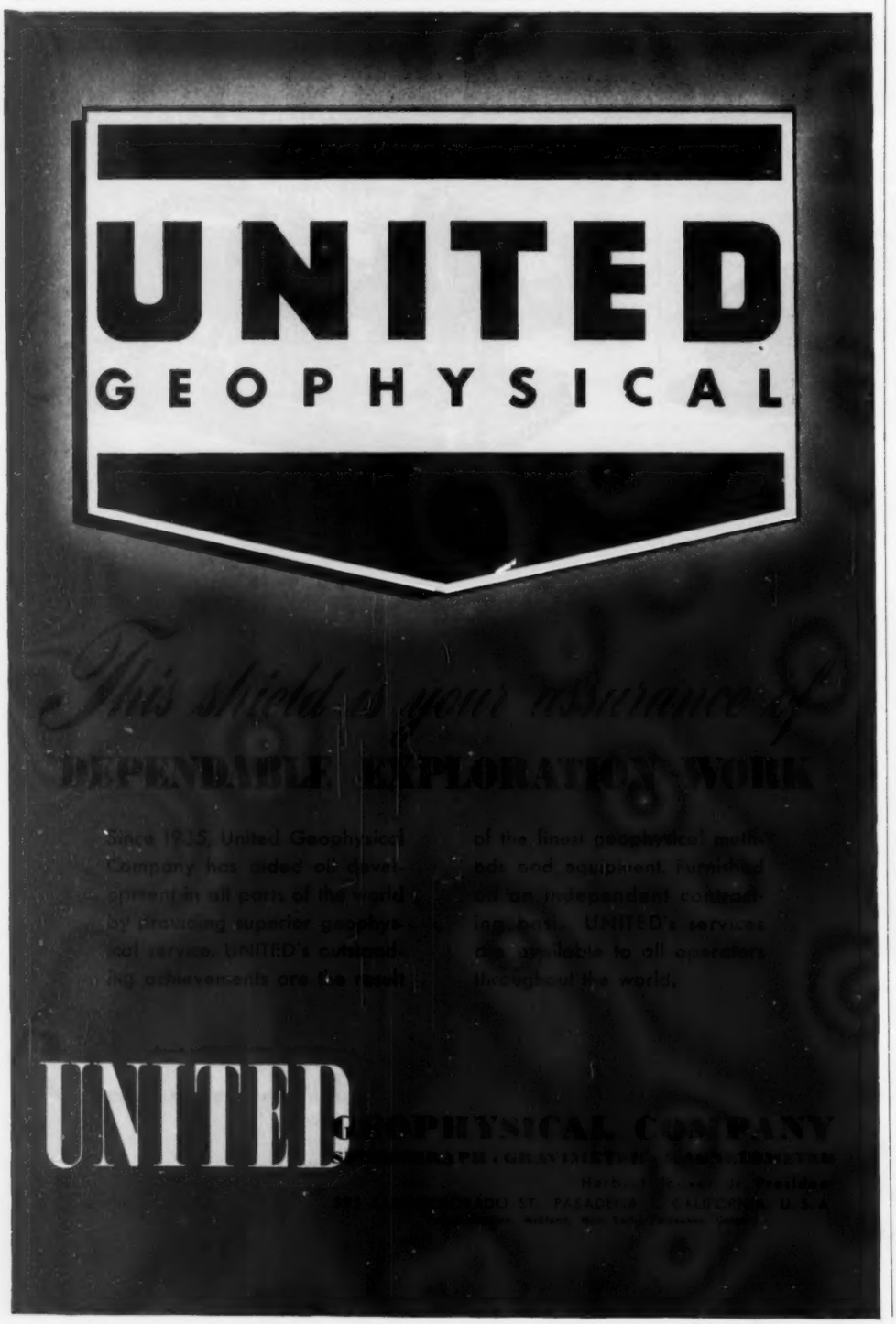
American Cyanamid Co., Michigan City, Ind., will soon begin construction of a $3 million plant to produce cracking catalysts for refiners in the midwest and along the eastern seaboard. Cyanamid originally purchased a plant site in East Chicago, but requirements for additional capacity forced the company to change to a larger site in Michigan City.

When the Michigan City plant is completed, the company's present catalyst capacity will be increased by more than 50 percent. It is expected that the new facilities will be in operation towards the middle of 1951. Cyanamid already has a plant in Fort Worth, Texas, which supplies cracking catalysts to refineries in the Gulf Coast area in the western states.

The new plant will be devoted primarily to the production of microspheroidal cracking catalysts, which were developed through extensive research in cooperation with the petroleum industry, and of which American Cyanamid is now the only producer. In its consolidated Research Laboratories in Stamford, Conn., the company maintains facilities, keyed to the requirements of the petroleum industry, for development and application studies of new catalysts, as well as lubricating oil additives and other products used by this industry.

To Enlarge Lake Charles Plant

Continental Oil Co. will spend $10,500,000 to increase the crude oil charging capacity of its Lake Charles, La., refinery to 25,000 barrels daily and to build a catalytic cracking unit and additional equipment for the production of high octane gasoline. Completion is scheduled for the early part of 1952. A large part of the 3,000 to 4,000 barrels daily of avgas—115 to 145 octane—that Continental has contracted to the Navy will be blended at and move through the Lake Charles refinery.



Harvey W. Blankenship

Harvey Blankenship Honored

Harvey W. Blankenship, director of public relations of Universal Oil Products Co., was honored Friday evening, Sept. 29, at a dinner in the Crystal Ballroom of the Blackstone Hotel, Chicago. The affair was given by David W. Harris, president of Universal, in recognition of Mr. Blankenship's five years of service to the company.

Guests attending included Chicago advertising men, newspaper writers, industrial publishers, bankers and lawyers. Also attending were advertising and public relations men from New York, Cleveland, Tulsa, Oklahoma, Houston, Texas and other points. Many members of the Universal organization were present, including top executives and members of the board of directors.

The principal speaker of the evening was Colonel Russell L. Putman, Chicago publisher. Col. Putman's talk stressing the importance of good advertising and a sound public relations program to industrial companies, pointed out that "Only as our best ideas are disseminated and used is our real wealth created and our economy bettered, our standard of living raised . . . locked, as secrets, in the minds of their creators or in the files of their company records, they are worthless . . . contribute nothing, to our nation or to those who create them."

In addition to Col. Putman's address, brief talks were made by Mr. Harris and Dr. Gustov Egloff, Universal's internationally known petroleum scientist.

Joins Quarter Century Club

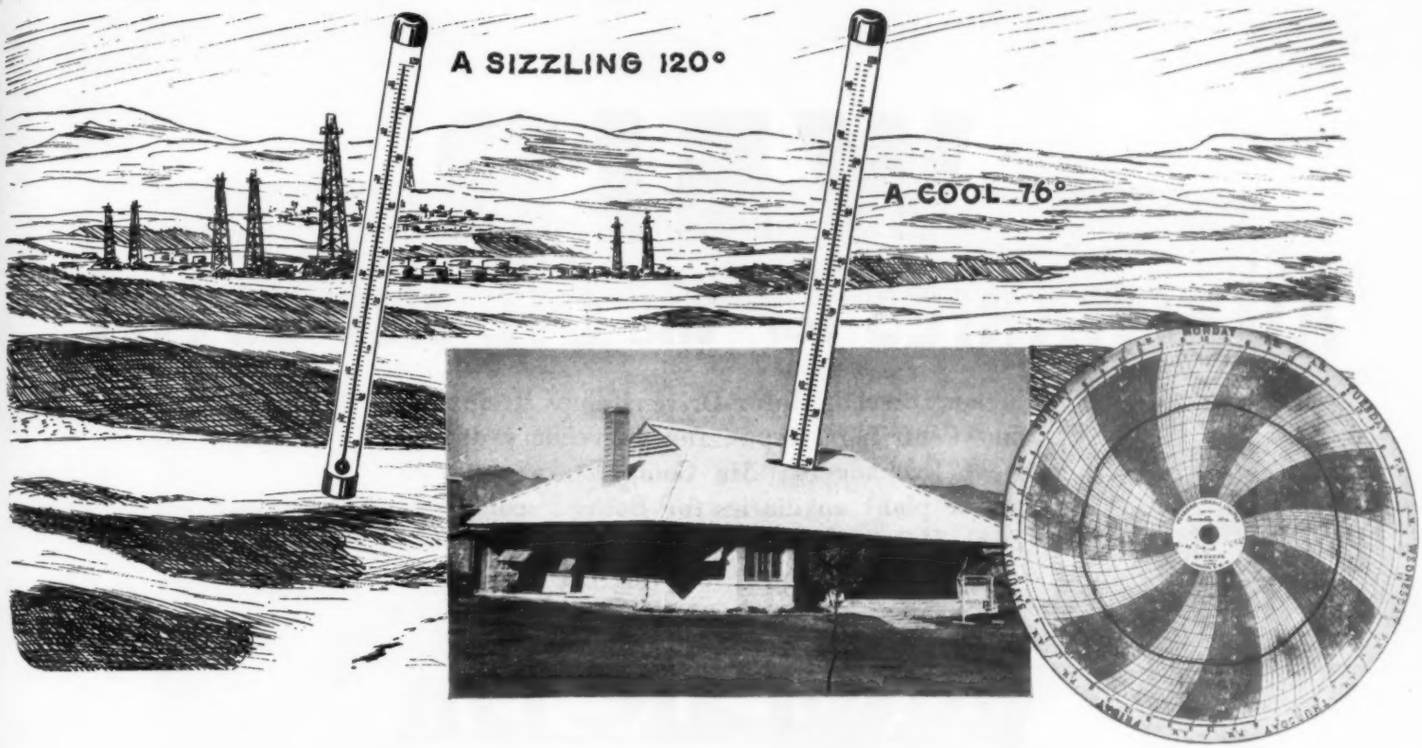
Milo E. Smith, advertising manager of Chicago Bridge & Iron Co., has joined that company's Quarter Century Club. He has been in charge of the company's advertising since Jan. 1, 1926, and was a member of the department prior to that time. He also edits the company magazine, *The Water Tower.*

Heads Century Seismic Operations

Ben F. Rummerfield has been appointed manager of seismic operations for Century Geophysical Corp., Tulsa. Mr. Rummerfield has worked in the midcontinent and Rocky Mountain as well as Latin American areas for Seismograph Service Corp. since 1940. In 1945 he was transferred to Venezuela as geophysical supervisor. More recently he served as assistant manager and geophysical supervisor in Mexico and was instrumental in setting up and operating the offshore seismic work in the Bay of Campeche.

Orders New Towboat

Socony-Vacuum Oil Co. Inc. has ordered a powerful new towboat from the St. Louis Shipbuilding & Steel Co., St. Louis, Mo., to operate principally on the Mississippi, Ohio and Illinois Rivers. Powered by twin screws and two 1,600-horsepower diesel engines, the new towboat will be 156 feet long, with a beam of 35 feet and a moulded depth of 11 feet. Its draft will be eight feet. It will handle a tow of eight 10,000-barrel barges.



SERVEL AIR CONDITIONING MEETS YOUR CONDITIONS BEST

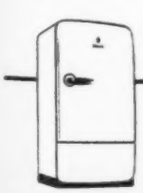
Provides ideal indoor climate in any land. Operates on NATURAL GAS, Manufactured Gas, Butane, Propane, or Steam

Cool, bracing, fresh air—for sleeping, for working, for comfortable living, no matter what the climate outdoors. It's vital to your staff . . . vital to your business. The *practical* way to provide it *anywhere in the world* is with the versatile Servel system of air conditioning. No extra generating equipment is required. No burden is placed on present sources of electricity. Servel cools simply by absorption. Energy sources are natural gas, manufactured gas, butane, propane or steam. In operations like yours, this spells *economy*, *convenience* and *adaptability*. Already many Servel units are operating throughout the world. Users report complete satisfaction.

One compact central unit refrigerates the air . . . removes the oppressing, sticky humidity . . . then circulates the refreshing coolness through oversize filters which sift out all the dust, dirt and pollen. At times when prevailing temperatures outdoors are comfortable, Servel simply filters and circulates the air evenly and without drafts. This ideal weather control extends *all year round*, too, for the Servel *ALL-YEAR* Air Conditioner heats as well as cools. Send us your address, and we'll forward you all details on how Servel meets *your* conditions best.

COOL, REFRESHING TEMPERATURE MAINTAINED EVENLY DAY AND NIGHT

The above graph shows an hour-by-hour recording of the actual temperatures inside a Servel-equipped bungalow in the Middle East during the week of August 13-20, 1949. On each of these days, outside temperatures climbed higher than 115°.



. . . AND THE SERVEL REFRIGERATOR MEETS YOUR CONDITIONS BEST, TOO

Servel is famous for bringing the important benefits of modern, automatic refrigeration to the most out-of-the-way places on earth. The reason is Servel's *different, advanced* freezing system which operates on natural gas, manufactured gas, butane, propane or kerosene. It's especially *practical* and *economical* for you.

Servel Inc.
INTERNATIONAL DIVISION
20 PINE STREET, NEW YORK 5, N. Y., U. S. A.

WEIR

AUXILIARIES for the OIL INDUSTRY

Steam, Diesel or Motor-Driven Pumps, Reciprocal and Centrifugal types, for all refinery duties; Heat Exchangers; Air Compressors; and all power plant auxiliaries for Boiler Feeding and Feed Heating. Write for Catalogue Section IL.81 "Weir Pumps for the Oil Industry."

G. & J. WEIR LTD.
CATHCART : GLASGOW

INTERNATIONAL Protection

SUNLIGHT
SYNTHETIC
ENAMEL
Protect the outsides of Road Tankers, Oil-field Plant etc. with the finest protective & decorative enamel.
TANCTECTOL
Insoluble in petroleum products, benzol and coal tar derivatives, TANCTECTOL provides the interiors of transport tanks and refinery plant protection from corrosion.

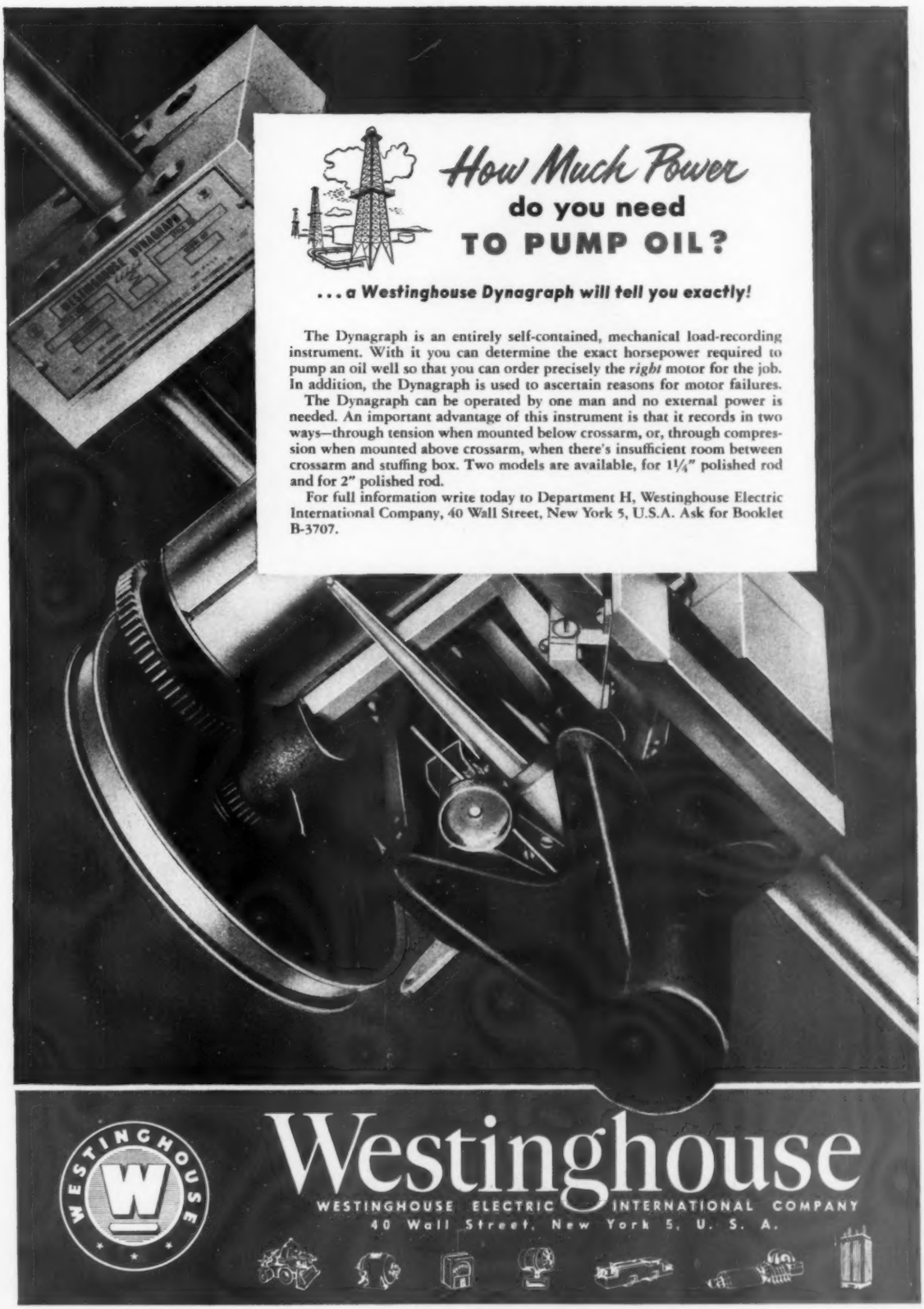
Registered Trade Mark

International Paints Ltd

GROSVENOR GARDENS HOUSE : GROSVENOR GARDENS, LONDON S.W.1. ENGLAND

Telephone: Victoria 3161 (10 lines)

Associated Companies and Agents throughout the world.



How Much Power
do you need
TO PUMP OIL?

. . . a Westinghouse Dynagraph will tell you exactly!

The Dynagraph is an entirely self-contained, mechanical load-recording instrument. With it you can determine the exact horsepower required to pump an oil well so that you can order precisely the *right* motor for the job. In addition, the Dynagraph is used to ascertain reasons for motor failures.

The Dynagraph can be operated by one man and no external power is needed. An important advantage of this instrument is that it records in two ways—through tension when mounted below crossarm, or, through compression when mounted above crossarm, when there's insufficient room between crossarm and stuffing box. Two models are available, for 1¼" polished rod and for 2" polished rod.

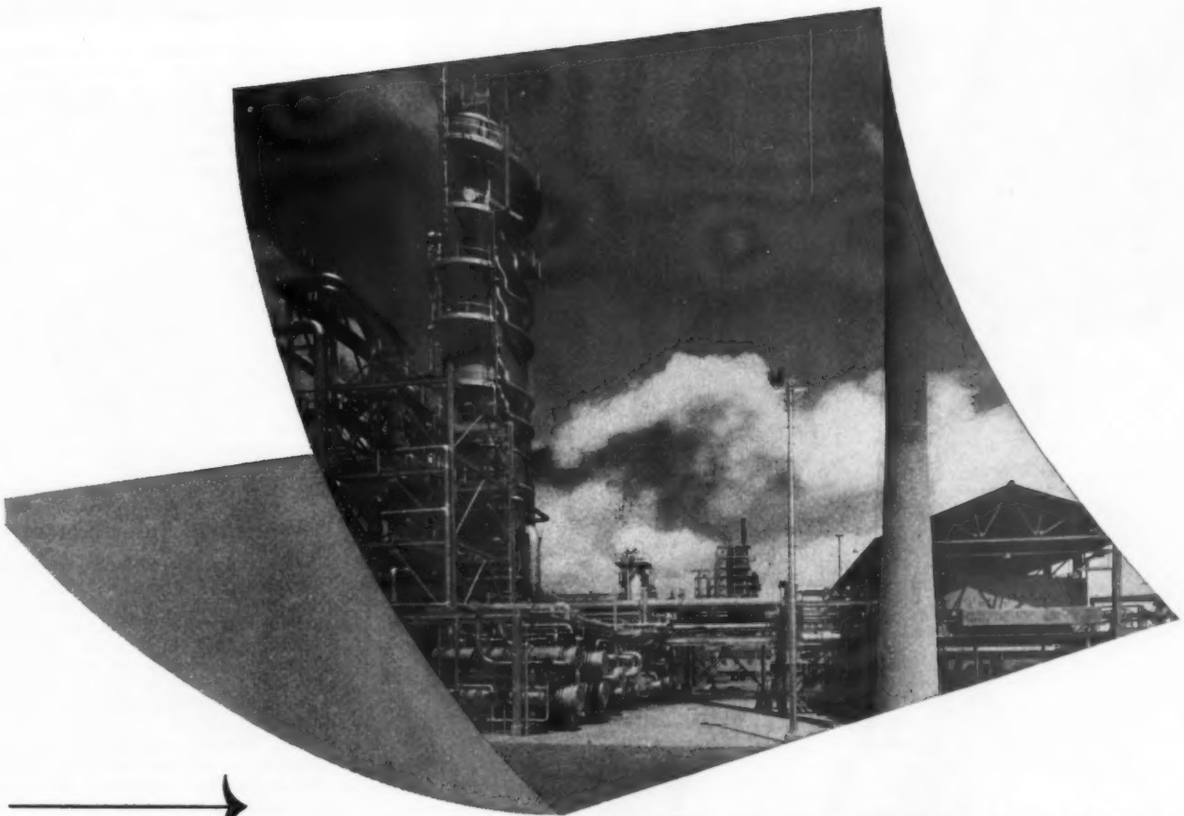
For full information write today to Department H, Westinghouse Electric International Company, 40 Wall Street, New York 5, U.S.A. Ask for Booklet B-3707.

Westinghouse

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY
40 Wall Street, New York 5, U. S. A.

NEW LUBE OIL PLANT FOR SOHIO

designed and built by LUMMUS



In mid-July a new and complete lubricating oil plant went on stream at SOHIO's large Lima refinery. Lummus designed and built four of the five processing units which will produce approximately 1800 barrels per day of high grade lubricating oils.

Lummus applied new and improved techniques in the design of SOHIO's lube-oil plant. A new fluidized method of clay handling is employed in the contact units. A hot oil-belt system provides all the heat required for the FURFURAL, MEK, and CLAY-CONTACT Units. A single console instrument panel is used to control the operation of the FURFURAL and MEK Units.

The Lima plant reflects the leading role Lummus has played in the building of outstanding lube-oil refineries. Lummus has designed and constructed over 115 lubricating oil processing units. To a study of your individual problems, whether solvent refining, the modernization and expansion of existing units, or new projects, Lummus can add the experience gained through years of designing and building petroleum, petroleum chemical and chemical plants.

PETROLEUM HORIZONS, the new 80-page book on Lummus processes and plants, features a step-by-step description and flow sheets for 31 refinery processes. Your copy available on request.

THE LUMMUS COMPANY

designing engineers and constructors for the petroleum and chemical industries

385 Madison Avenue · New York 17, N. Y.

CHICAGO · HOUSTON · LONDON · CARACAS · PARIS

AXELSON Deep Well Plunger Pumps deliver more oil at less lifting cost with less down time. There is an Axelson Deep Well Plunger Pump for every specific well condition.

AXELSON Sucker Rods backed by 56 years of factory know-how, are duty designed, service proved under every well condition, making them "First choice" in the Petroleum production field.

AXELSON PETROLEUM PRODUCTION EQUIPMENT

WRITE FOR BULLETINS ON: Sucker Rods and Couplings, Pump Liners, Pump Plungers, Balls and Seats, Specific Deep Well Plunger Pump Assemblies, Long Stroke Pumping Units, Pumping Accessories.

AXELSON PETROLEUM PUMPING EQUIPMENT

Ask Axelson experts for practical answers

AXELSON MANUFACTURING CO. • PLANTS — Los Angeles 58; St. Louis 16 • OFFICES — New York City 7; Tulsa 1; Buenos Aires, Argentina; Caracas, Venezuela • DISTRIBUTORS — Jones & Laughlin Supply Co., Great Northern Tool & Supply Co., Industrial Agencies, Ltd., San Fernando, Trinidad, B.W.I.; Industrias Weberlo & Campbell, Barcelona and Maracaibo, Venezuela; Dominion Oil Field Supply Co., Ltd., Calgary, Canada.

Kirkuk Line License Issued

The Department of Commerce has issued licenses for the export of 50,000 tons of steel for construction of the 555-mile oil pipeline from the Kirkuk field to the Eastern Mediterranean by the Iraq Petroleum Co. The decision means that the United States has decided to allot to the project a total of at least 190,000 tons of 30-inch steel tubing. Only the United States makes pipe of this size. The line will have a capacity of 300,000 barrels daily.

New Catalytic Reforming Process

Atlantic Refining Co. is developing a new catalytic process for reforming naphtha to improve its knock rating, it was revealed in a recent address by R. L. Hockley, vice president of Davison Chemical Corp., before the New York Society of Security Analysts. The Davison company has been co-operating with Atlantic in research work involved in production of the catalyst. Mr. Hockley revealed that the new Atlantic process has important implications since it could be used to help overcome the current benzol shortage in the United States.

A substantial part of the Davison business now consists of oil industry catalysts, Mr. Hockley said. The company has increased its capacity eight-fold since the first catalyst plant was put into production in 1942.

Another important Davison development is the application of silica gels to the selective separation of olefins and aromatics by absorption and elutriation without resorting to azaeotropic distillation methods.

Wakefield Sales Executive Retires

Rowland G. Goodwin is retiring after 42 years' service with the Wakefield Oil Company of London. Practically all of this period has been spent in the sales department, of which he has been manager for many years. When he joined the company, it was housed in three small rooms and its staff was 15 in number under the personal direction of C. C. Wakefield, later Viscount Wakefield.

Mr. Goodwin was closely associated with the building up of the marketing organization which led to the vast expansion of Castrol sales, first as assistant to Alonzo Limb and from 1938 as manager.

Mr. Goodwin will be succeeded as manager of the Castrol sales department by C. E. R. Millidge, who has been his assistant since 1946. Mr. Millidge joined Wakefield's in 1918 and for a number of years was the company's representative in the Buckinghamshire and Northamptonshire areas.

Jeep-Mounted Drill

Equipment for drilling up to 100 feet of four-inch hole either vertically or horizontally now has been developed for use with the Willys-Overland Universal Jeep, according to A. R. Ficker, equipment engineer. The equipment mounts at the rear end of the Jeep and obtains power from the rear power takeoff. The Jeep's hydraulic system provides leverage for raising and lowering the drill boom. A seven-foot, four-inch steel tower is low enough to permit passage of the mobile drill under bridges. The drill boom can be moved from vertical to horizontal positions in five minutes. The drill is manufactured by Mobile Drilling Inc., Indianapolis.

Antioxidant Bulletin

Technical bulletin AO-50 has been prepared by the Petroleum Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., to describe the use and application of Du Pont antioxidants Nos. 5, 6 and 22 for improving gasoline storage stability. The bulletin gives the composition and physical properties of the antioxidants and explains the mechanism of oxidation and the function of the antioxidant. Data is given covering methods of addition and equipment required. Copies of the bulletin are available on request.

BEAD EXPANDERS

For Welded Drums etc.

MODEL Q.K.

MODEL P.K.
STATIONARY BEAD
EXPANDING MACHINE

The operation of bead expanding is quicker in action than rolling, and produces beads on drum bodies deeper than is practicable by the rolling method. The bead is drawn up from the length of the drum without undue fatigue or crystallisation of the metal.

Model Q.K. produces beads up to 1½ in. on dia.; drum capacity 10-16 in. dia.; centre of tool to back 15½ in.; 20 B.W.G. material.

Model P.K. produces beads up to 2 in. on dia.; drum capacity 17¾-50 in. dia.; centre of tool to back 30 in.; 14 B.W.G. material.

Write for full details.

MOON

Regd. Trade Mark

MOON BROTHERS LIMITED, BEAUFORT ROAD, BIRKENHEAD, ENGLAND

Cables: "Moonbro" Birkenhead, England.

LONDON OFFICE: Abbey House, 2/8 Victoria Street, Westminster, S.W.1., England, Cables: Moonbro, Sowest, London, England

MAKERS OF TIN BOX AND DRUM MAKING MACHINERY.

dm MB 31

ADVERTISERS INDEX

(Advertising Agencies in Italics)

Anglo Iranian Oil Co. 3
S. H. Benson Ltd.
Attapulgus Clay Co. 10
Harris D. McKinney Organization
Axelson Manufacturing Co. 100
Heintz & Co.
E. B. Badger & Sons Ltd. 29
Thames Advertising Ltd.
Harold Cabot & Co.
Bechtel Corp. 27
Ryder & Ingram Ltd.
Billington & Newton Ltd. 87
Born Engineering Co. 67
Watts, Payne—Advertising, Inc.
S. R. Bowen Co. 31
Dozier Graham Eastman
British Ceca Co. Ltd. 89
British Ropes Ltd. 102
D. J. Keymer & Co. Ltd.
California Texas Oil Co. 12
Cunningham & Walsh, Inc.
Chicago Bridge & Iron Co. 1
Russell T. Gray, Inc.
Cities Service Co. 24
Albert Frank—Guenther Law, Inc.
Cooper-Bessemer Corp. 4
The Griswold-Eshleman Co.
Davison Chemical Corp. 30
St. Georges & Keyes, Inc.
Dikkers & Co. 39
N. V. Adrema
Ethyl Corp. 5
Batten, Barton, Durstine & Osborn, Inc.
Joseph Evans & Sons Ltd. 98
Cogent Advertising Service Ltd.
Fellows & Stewart, Inc. 88
John C. Fellows Co.
Ferodo Ltd. 14
Messrs. Townsend-Smith Ltd.
Fluor Corp. 16
Dozier Graham Eastman
Foster Wheeler Corp. 21-22
Albert Frank—Guenther Law, Inc.
General Controls 88
Hixson & Jorgensen, Inc.
General Electric Co. 17-20
Geophoto Services 6
Arthur G. Rippey & Co.
Gulf Oil Co. 34
Young & Rubicam, Inc.
Halliburton Oil Well Cementing Co. 42
Lannan & Sanders
G. A. Harvey & Co. Ltd. 33
Gordon Hargrave & Co.
Stuart Advertising Agency Ltd.
Hayward Tyler & Co. Ltd. 7
Arks Publicity Ltd.
Highland Park Manufacturing Co. 86
Frank B. Cole Advertising
Hughes Tool Co. Third Cover
Foote, Cone & Belding
Hurst-Nelson & Co. Ltd. 89
Independent Exploration Co. 71
Albert Evans Advertising
International General Electric Co. 17-20
Grant Advertising, Inc.
International Harvester Export Co. 38
McCann-Erickson Corp.
International Paints, Ltd. 96
Mayfair Advertising, Ltd.
International Petroleum Consultants, Inc. 90
Frank B. Cole Advertising
M. O. Johnston Oil Field Export Corp. 85
Dozier Graham Eastman
M. W. Kellogg Co. 91-92
Gordon Baird Associates, Inc.
Lane-Wells Co. 77
Darwin H. Clark Co.
Lummus Co. 98-99
G. M. Basford Co.
Arthur G. McKee & Co. 13
Meermans, Inc.
Mather & Platt, Ltd. 26
Sidney F. Wicks, Ltd.
Metal Containers 23
Murray-Watson Advertising Service
Moon Brothers 101
Donald MacDonald Advertising Ltd.
Lee C. Moore Corp. 15
Watts, Payne—Advertising, Inc.
Newman Hender & Co. Ltd. 87
J. F. Pritchard & Co. 32
Carter Advertising Agency, Inc.
Pyrene & Co. Ltd. 2
Nelson Advertising Service, Ltd.
Robert H. Ray Co. 86
T. Page Rogers Advertising
Rheem Manufacturing Co. 35
Foote, Cone & Belding
Rockweld, Ltd. 36
John Mitchell & Partners, Ltd.
Rogers-Ray, Inc. 86
Schlumberger 65
Rives, Dyke & Co.
Servel, Inc. 95
Batten, Barton, Durstine & Osborn, Inc.
Shaffer Tool Works 69
Dozier Graham Eastman
Socony Vacuum Oil Co. 28
Compton Advertising, Inc.
Spirax Manufacturing Co., Ltd. 84
Harry Dawson Advertising
Standard Oil Co. (New Jersey) 75
McCann-Erickson, Inc.
Standard Vacuum Oil Co. 11
Sam J. Gallay Co.
Tide Water Associated Oil Co. 73
Lennen & Mitchell, Inc.
United Geophysical Co. 94
Dozier Graham Eastman
United Steel Companies 81
Rowlinson-Broughton
Universal Oil Products Co. 8-9
Almon Brooks Wilder, Inc.
Universal Petroleum Co. 40
Watts, Payne—Advertising, Inc.
Henry Vogt Machine Co. 79
Farson & Huff, Advertising
Warren Petroleum Corp. Second Cover
Gibbons Advertising Agency, Inc.
G. & J. Weir 96
Richards & Thompson
Western Geophysical Co. 25
Martin R. Klitten Co., Inc.
Westinghouse Electric International Industries 97
National Export Advertising Service, Inc.
Willys-Overland Export Corp. 37
Canaday, Ewell & Thurber, Inc.
Wyatt Metal & Boiler Works Fourth Cover
Wallace Davis & Co.
Youngstown Sheet & Tube Co. 83
The Griswold-Eshleman Co.

Venezuelan employee operating drilling rig—A Shell photograph.

If ROPE could talk...

. . . . it would voice some protest about the stresses and strains it suffers. For remember—although most rope is made to stand a fair amount of rough usage—there is a limit to its endurance. Using the correct rope for the job makes a lot of difference—and that is where British Ropes Limited can help. Why not consult them?

BRITISH ROPES LIMITED

BRITISH ROPES LIMITED

Licensed to use the A.P.I. monogram for Wire Rope

Head Office:
Doncaster, England. Oilfield Rope. Sales Office: 52, High Holborn, London, W.C.1, England.
Telephone: Chancery 8822. Telegrams: Britrope, London.
New York: 18, South Street. Montreal: 13, St. James Street West.

Hughes Flash-Weld your best buy in tool joints!

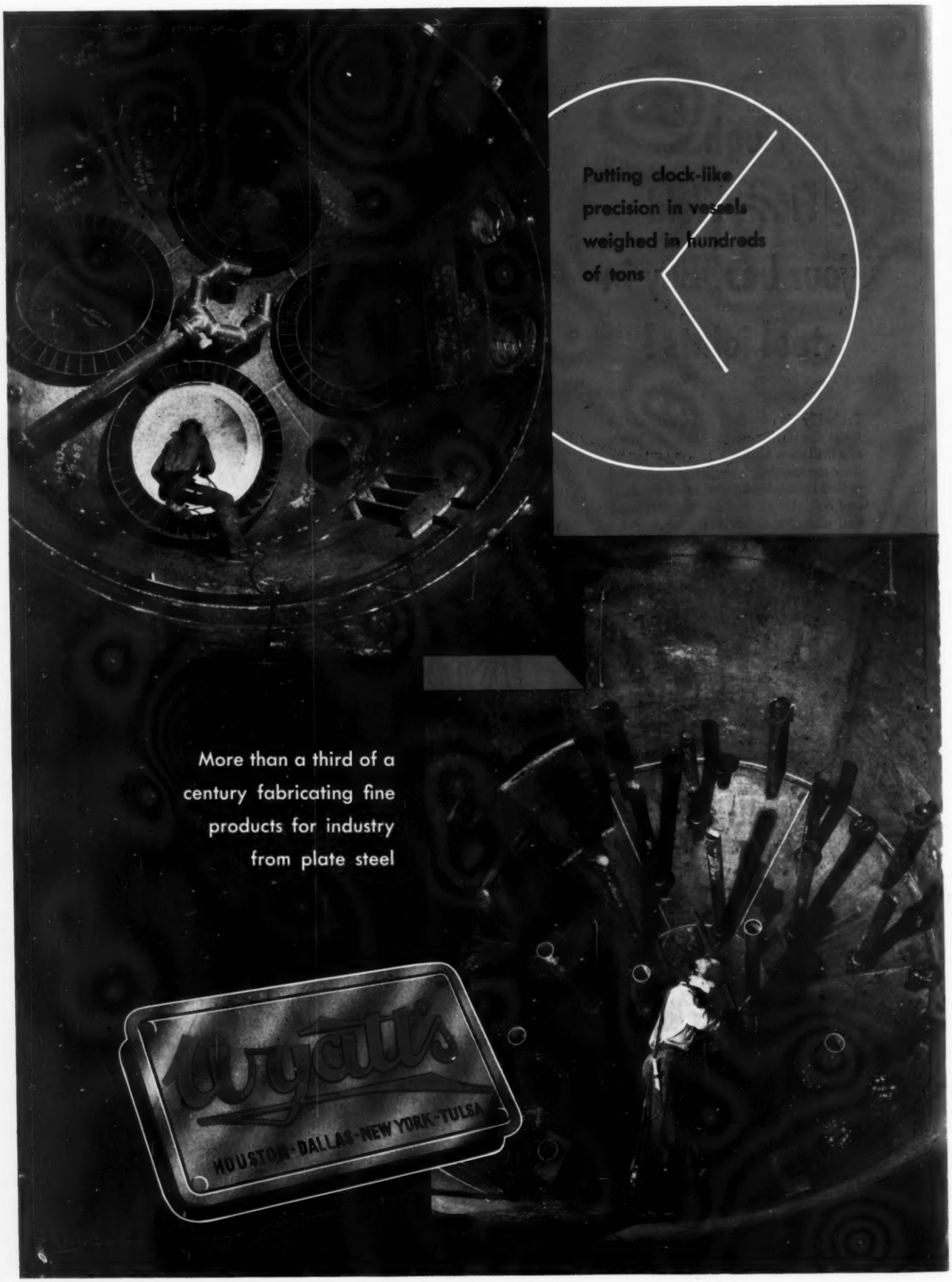
Probably no coupling in industrial use takes the terrific beating that the joints of a drill stem undergo. During rotation, they are constantly twisted, flexed and pulled by the heavy weight of the stem and collars, and ground by gritty mud and abrasive sands.... It's no wonder joints need to be strong and enduring. Failure of *one* joint in a stem at any depth is costly!

Failure of a Flash-Weld joint in field operation is almost unknown! The Flash-Weld Tool Joint, a development of Hughes Tool Company, entirely eliminates the threaded pipe connection—the cause of nearly all drill-stem failures.

Any Hughes field man will tell you more about the construction and value of Flash-Weld joints. A string of Flash-Weld Tool Joints is the most enduring, most economical buy you can make in drill stem. Talk to a contractor who runs them!

FLASH-WELD
Tool Joints, a development of

HUGHES
TOOL COMPANY
HOUSTON, TEXAS


Putting clock-like precision in vessels weighed in hundreds of tons
More than a third of a century fabricating fine products for industry from plate steel
Wyatt's
HOUSTON-DALLAS-NEW YORK-TULSA